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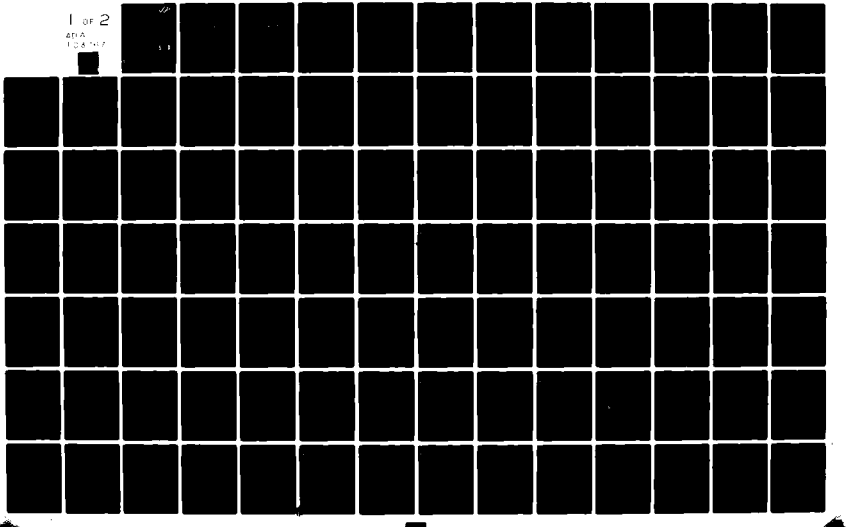

LEVEL II

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EVALUATION OF SHORT-TERM BIOASSAYS TO PREDICT FUNCTIONAL IMPAIRMENT

Development of Pulmonary Bioassays in Small Animals/

Directory of Institutions/Individuals Involved in Utilization

Final Report

Steve Drill, Richard Thomas, Terry Zimmerman

October 1980

Supported by

U.S. ARMY MEDICAL RESEARCH AND DEVELOPMENT COMMAND
Fort Detrick, Frederick, Maryland 21701

Contract No. DAMD17-78-C-8068

The MITRE Corporation
1820 Dolley Madison Boulevard
McLean, Virginia 22102

Contracting Officer's Technical Representative:
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U.S. ARMY MEDICAL BIOENGINEERING RESEARCH AND DEVELOPMENT LABORATORY
Fort Detrick, Frederick, Maryland 21701

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER (6)	2. GOVT ACCESSION NO. AD-A10 3767
4. TITLE (and Subtitle) EVALUATION OF SHORT-TERM BIOASSAYS TO PREDICT FUNCTIONAL IMPAIRMENT. Development of Pulmonary Bioassays in Small Animals--Directory of Institutions/Individuals (14)	5. TYPE OF REPORT & PERIOD COVERED Final Directory-- September 1978-July 1980
	6. PERFORMING ORG. REPORT NUMBER WP-79W00222
7. AUTHOR(s) (10) Steve Drill, Richard Thomas, Terry Zimmerman	8. CONTRACT OR GRANT NUMBER(s) (15) DAMD17-78-C-8068
9. PERFORMING ORGANIZATION NAME AND ADDRESS The MITRE Corporation, 1820 Dolley Madison Boulevard, McLean, Virginia 22102	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS (17) 61102A 3E161102BS04 00 046 (16)
11. CONTROLLING OFFICE NAME AND ADDRESS U.S. Army Medical Research and Development Command, Fort Detrick, Frederick, Maryland 21701 (11)	12. REPORT DATE October 1980
	13. NUMBER OF PAGES 123
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) U.S. Army Medical Bioengineering Research and Development Laboratory, Fort Detrick, Frederick, Maryland 21701 (12) 115	15. SECURITY CLASS. (of this report) Unclassified
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited

(9) Final Rept. Sep 78 - Jul 80

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

This directory is a companion t Selected Short-Term Pulmonary Toxicity Tests. Documents and directories have also been prepared for the cardiovascular, renal and hepatic systems.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Pulmonary toxicity	Distribtuion of ventilation	Toxic substances
Directory	Carbon monoxide diffusing capacity	
Research organizations	Functional residual capacity	
Compliance, resistance	Tests systems utilized	
Lung volumes	Compounds tested	

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Mitre has been requested by the U.S. Army Medical Bioengineering Research and Development Laboratory to identify and evaluate short-term bioassays which have demonstrated ability to evaluate and predict pulmonary impairment resulting from toxicant exposures. This directory is a companion to Selected Short-Term Pulmonary Bioassays, MTR-80W00233, which describes available pulmonary testing protocols and assesses their suitability for a screening program. This directory catalogues the organizations currently engaged in pulmonary

(continued on back page)

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bioassay utilization or development and provides information concerning specific measurements performed, test systems employed, compounds tested, requirements for anesthesia and terminal nature of the test. Both this directory and the companion document of testing protocols were prepared under Contract No. DAMD-17-78-C-8068.

EXECUTIVE SUMMARY

The Metrek Division of the MITRE Corporation under contract to the United States Army Medical Bioengineering Research and Development Laboratory, is reviewing and recommending short-term tests for evaluating and predicting the functional and/or morphological impairment produced by toxic substances using animal test systems. This document is a directory of organizations and individuals involved in the development and/or utilization of tests applicable to the screening of toxic substances in the pulmonary system. This directory serves as a companion document to the report, Evaluation of Short-Term Bioassays To Predict Function Impairment: Selected Short-Term Pulmonary Toxicity Tests, which presents information on the available tests for the pulmonary system and recommends those tests which are suitable for use in a screening program.

This directory is arranged in alphabetical order by organization. Under the organization name and address is the name of the person contacted. The information provided for each organization includes specific tests and observations performed; the test systems utilized (e.g., experimental animals or in vitro preparations); the substances administered or conditions established to elicit a toxic response; the use of anesthesia, and the terminal nature of the tasks conducted.

Three indexes have been prepared and are included as appendices. Appendix A, is an alphabetical index of tests performed by each organization engaged in developing, performing or refining the tests noted. Appendix B is an alphabetical index of tests utilized, and all the organizations employing each test system. These are further divided by tests performed. Appendix C is an alphabetical index of the individuals in the directory.

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FOREWORD

This Directory was compiled by MITRE staff by means of a survey of the recent literature, and by discussions with leaders in the field and other personal contacts. We are grateful to all those who responded so patiently to our questions regarding their activities. All of the "contact persons" were given an opportunity to review the information relating to their organization. We recognize there may be inadvertent omissions for which we offer our sincere apologies.

Citations of organizations and trade names in this report do not constitute an official Department of the Army endorsement or approval of the products or services of these organizations.

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INTRODUCTION

The MITRE Corporation, Metrek Division is currently assisting the United States Army Medical Bioengineering Research and Development Laboratory (USAMBRDL) in the development of a hierarchical short-term testing scheme to screen substances for functional or morphological impairment in animal test systems. Effects in four organ systems--pulmonary, hepatic, renal and cardiovascular--are being considered.

As part of this effort, Metrek has been asked to prepare directories of organizations and individuals presently involved in the development and/or utilization of tests applicable to toxicity screening. Each directory serves as a companion document to its Selected Short-Term Bioassay report, and together they evaluate the suitability of the bioassays for toxicant screening.

Entries in each directory for several organizations currently involved in the organ bioassay use or development include at least one contact individual's name, which appears under the organization name and address at the top of the page. These are the people who, during the process of directory compilation, described either their activities or the activities of their group regarding organ toxicity testing, and thereby provided the information presented in the entry. The information provided includes the specific tests and observations performed; the test systems utilized (e.g., experimental animals or

tissues *in vitro*); the substances administered or conditions established to elicit toxic response (e.g., stress); the use of anesthesia, and the terminal nature of the tests conducted.

In order to facilitate use and the processes of amending and adding to the directory, it has been arranged in alphabetical order by organization. In order to further simplify use of the directory, three indexes have been prepared and are included as appendices. The first, Appendix A, is an alphabetical index of tests performed by each organization engaged in developing, performing or refining the tests noted. Appendix B is an alphabetical index of *tests* utilized, and all the organizations employing each test system. These are further divided by tests performed. In this way it is possible to ascertain which organizations perform particular bioassays in a specific test system. Appendix C is an alphabetical index of the individuals mentioned in the directory, and the organization with which they were affiliated when contacted.

The objective of this directory is to provide a readily usable guide to that segment of the scientific community currently active in organ system toxicity testing in animals. Because research associate and graduate student positions are often temporary in nature, a deliberate attempt was made to exclude these individuals from the directory. Their efforts, however, are likely to be represented by activities associated with their organization, as in most cases these individuals are conducting research under the

auspices of someone more senior and more permanently allied with the organization, who was included in the directory. In addition, there are individuals who were active in toxicity testing at one time but are no longer; these have also been omitted from the directory. The efforts of many of those who are not currently active, but were involved over a period of many years and distinguished themselves in the field, are reflected in the various Selected Short-Term Bioassay reports.

Some of the entries in the directory may be less detailed than others, and less specific in the detail that is presented. In addition, the information presented for an organization may not be reflective of all the ongoing efforts at that organization. This is due largely to the reluctance of some individuals contacted to communicate the information and, in small part, to an inability to contact a few individuals at the time this directory was being compiled. The information in the directory was selected to provide an immediate indication of the practices of each organization concerning some issues of importance when designing a screening program. Much of this information is discussed in greater detail in the Selected Short-Term Bioassay reports.

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DIRECTORY OF ORGANIZATIONS CURRENTLY INVOLVED IN UTILIZATION
OR DEVELOPMENT OF PULMONARY TESTS IN SMALL ANIMALS

ORGANIZATION:

ALLIED CHEMICAL CORPORATION
MORRISTOWN, NEW JERSEY 07960

DR. DOMINGO M. AVIADO (201) 455-4524 (Contact)

TESTS PERFORMED:

FUNCTIONAL RESIDUAL CAPACITY - NITROGEN DILUTION
COMPLIANCE, RESISTANCE - PLETHYSMOGRAPH WITH INTRAPLEURAL CATHETER
GENERAL MORPHOLOGY, HISTOPATHOLOGY

TEST SYSTEMS UTILIZED:

RATS, MICE

COMPOUNDS TESTED:

CIGARETTE SMOKE, CHLORINATED SOLVENTS, FLUOROCARBONS

ANESTHESIA:

TESTS ARE PERFORMED UNDER COMPLETE ANESTHESIA

TERMINAL:

TESTS ARE TERMINAL

REMARKS:

DR. DOMINGO M. AVIADO IS VERY INTERESTED IN THE VALIDATION OF INHALATION TECHNIQUES FOR LUNG AND HEART TESTING; IN ADDITION TO DR. DOMINGO M. AVIADO, DR. DAVID J.P. BASSETT IS ACTIVELY INVOLVED IN PULMONARY TESTING AT THIS INSTITUTION.

ORGANIZATION:

BATTELLE MEMORIAL INSTITUTE
BIOLOGY DEPARTMENT
P.O. BOX 999
RICHLAND, WASHINGTON 99352

DR. SUSAN M. LOSCUTOFF (509) 946-2033 (Contact)
DR. P. J. MILHALKO (509) 375-2131 (Contact)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - PNEUMOTACHOGRAPH WITH ESOPHAGEAL CATHETERIZATION; PLETHYSMOGRAPH WITH ESOPHAGEAL CATHETERIZATION
FUNCTIONAL RESIDUAL CAPACITY - BOYLE'S LAW WITH PLETHYSMOGRAPH
VITAL CAPACITY - PLETHYSMOGRAPH WITH REGULATED TRANSPULMONARY PRESSURE
DISTRIBUTION OF VENTILATION BY NITROGEN-WASHOUT - SINGLE AND MULTIPLE BREATH
CARBON MONOXIDE DIFFUSING CAPACITY - MULTIPLE BREATH; SINGLE BREATH
PRESSURE-VOLUME CURVES
ARTERIAL BLOOD GASES
GENERAL MORPHOLOGY, HISTOPATHOLOGY

TEST SYSTEMS UTILIZED:

RATS, GUINEA PIGS, DOGS

COMPOUNDS TESTED:

ENERGY-RELATED EMISSIONS, ENVIRONMENTAL TOXICANTS, SULFURIC ACID, PARTICULATES, NITROGEN OXIDES, CARBON MONOXIDE, DIESEL EMISSIONS AND COAL PARTICULATES, SODIUM AND LITHIUM METALS

ANESTHESIA:

TESTS ARE PERFORMED IN BOTH CONSCIOUS AND ANESTHETIZED ANIMALS

TERMINAL:

TESTS ARE OF A SERIAL NATURE AND ARE TERMINAL IN GUINEA PIGS AND RATS

REMARKS

THE EMPHASIS IN THIS ORGANIZATION IS ON PERFORMING A MULTITUDE OF TESTS FOR INDICATING DAMAGE TO THE PULMONARY SYSTEM.

ORGANIZATION:

BOSTON UNIVERSITY
SCHOOL OF MEDICINE
BOSTON, MASSACHUSETTS 02215

DR. GORDON L. SNIDER (617) 247-5277 (Contact)

TESTS PERFORMED:

LUNG VOLUMES, LUNG CAPACITIES - PLETHYSMOGRAPH WITH REGULATED TRANSPULMONARY PRESSURE
FUNCTIONAL RESIDUAL CAPACITY - BOYLE'S LAW WITH PLETHYSMOGRAPH
PRESSURE-VOLUME CURVES - PLETHYSMOGRAPH PLUS INFLATOR; EXCISED LUNGS, AIR AND SALINE INJECTION
MAXIMUM FLOW VOLUME CURVES
CARBON MONOXIDE DIFFUSING CAPACITY
ARTERIAL BLOOD GASES
MEAN ALVEOLAR INTERCEPT - LIGHT MICROSCOPY
TYPE 1 CELL DAMAGE, TYPE 2 CELL PROLIFERATION

TEST SYSTEMS UTILIZED:

RATS, HAMSTERS

COMPOUNDS TESTED:

CADMIUM COMPOUNDS, BLEOMYCIN AND OTHERS

ANESTHESIA:

TESTS ARE PERFORMED UNDER SUSTAINED ANESTHESIA

TERMINAL:

ALL TESTS EXCEPT FOR MORPHOLOGY AND EXCISED LUNG STUDIES ARE OF A SERIAL NATURE

REMARKS:

THIS ORGANIZATION IS ACTIVELY INVOLVED IN RESEARCH AND TESTING OF VARIOUS ASPECTS OF THE PULMONARY SYSTEM; CHANGING RESEARCH PROJECTS VARY THE TYPE OF TESTS PERFORMED; DR. GORDON L. SNIDER ALSO WORKS AS CHIEF OF PULMONARY MEDICINE SECTION AT THE VETERANS ADMINISTRATION MEDICAL CENTER (617) 232-9500 EXT. 324.

ORGANIZATION:

BROOKHAVEN NATIONAL LABORATORY
MEDICAL DEPARTMENT
UPTON, NEW YORK 11973

DR. DANIEL L. COSTA (516) 345-3631 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - AMDUR AND MEAD TECHNIQUE
LUNG VOLUMES - PLETHYSMOGRAPH WITH REGULATED TRANSPULMONARY PRESSURE; GAS DILUTION (NEON)
FUNCTIONAL RESIDUAL CAPACITY - MANOMETRIC INTERRUPTION
DISTRIBUTION OF VENTILATION BY NITROGEN-WASHOUT - MULTIPLE BREATH
PRESSURE-VOLUME CURVES
CARBON MONOXIDE DIFFUSING CAPACITY - SINGLE BREATH AND REBREATHING MEFV CURVES

TEST SYSTEMS UTILIZED:

RATS, GUINEA PIGS

COMPOUNDS TESTED:

BLEOMYCIN, OIL MIST + SULFUR DIOXIDE, OIL MIST + FORMA
OZONE; ACROLIN
PHARMACOLOGIC AGENTS

ANESTHESIA:

SUSTAINED ANESTHESIA OR UNANESTHETIZED, DEPENDING ON EXPERIMENTAL OBJECTIVES

TERMINAL:

ANIMALS ARE TERMINATED OR STUDIED SERIALLY AS PROTOCOL DEMANDS.

ORGANIZATION:

CASE WESTERN RESERVE UNIVERSITY
CLEVELAND, OHIO 44106

DR. MARY J. THOMASSEN (216) 444-3318 (CONTACT)

TESTS PERFORMED:

ALVEOLAR MACROPHAGE FUNCTION (PHAGOCYTOSIS OF BACTERIA)
ALVEOLAR MACROPHAGE EXPOSED IN VITRO

TEST SYSTEMS UTILIZED:

RABBITS, GUINEA PIGS

COMPONENTS TESTED:

BACTERIAL CHALLENGE

ANESTHESIA:

ANESTHESIA IS NOT UTILIZED

TERMINAL:

TESTS ARE TERMINAL

REMARKS:

DR. THOMAS F. BOAT IS ALSO INVOLVED IN PULMONARY TESTING AT THIS ORGANIZATION.

ORGANIZATION:

EASTERN TENNESSEE STATE UNIVERSITY
COLLEGE OF MEDICINE
JOHNSON CITY, TENNESSEE 37601

DR. ANTHONY J. DELUCIA (615) 928-6426 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - PNEUMOTACHOGRAPH WITH ESOPHAGEAL CATHETERIZATION
DISTRIBUTION OF VENTILATION BY NITROGEN-WASHOUT - MULTIPLE BREATH
BIOCHEMISTRY
SINGLE-BREATH NITROGEN WASHOUT (SBN_2)

TEST SYSTEMS UTILIZED:

MONKEYS, DOGS

COMPOUNDS TESTED:

CIGARETTE SMOKE

ANESTHESIA:

TESTS ARE PERFORMED ON CONSCIOUS ANIMALS EXCEPT FOR SBN_2, WHERE KETAMINE AND NEMBUTAL ARE EMPLOYED.

TERMINAL:

TESTS ARE USUALLY OF A SERIAL NATURE.

ORGANIZATION:

GENERAL MOTORS RESEARCH LABORATORIES
BIOMEDICAL SCIENCE DEPARTMENT
WARREN, MICHIGAN 48090

DR. KENNETH B. GROSS (313) 575-3474 (CONTACT)

TESTS PERFORMED:

COMPLIANCE - PLETHYSMOGRAPH WITH ESOPHAGEAL CATERIZATION
FUNCTIONAL RESIDUAL CAPACITY - BOYLE'S LAW WITH PLETHYSMOGRAPH
MAXIMUM FLOW VOLUME CURVES

TEST SYSTEMS UTILIZED:

RATS

COMPOUNDS TESTED:

ENVIRONMENTAL POLLUTANTS ASSOCIATED WITH AUTOMOBILE EXHAUST

ANESTHESIA:

TESTS ARE PERFORMED UNDER SUSTAINED ANESTHESIA.

TERMINAL:

TESTS ARE OF A SERIAL NATURE.

ORGANIZATION:

HARVARD SCHOOL OF PUBLIC HEALTH
DEPARTMENT OF PHYSIOLOGY
BOSTON, MASSACHUSETTS 02115

DR. JEFFREY DRAZEN (617) 732-5833 (CONTACT)
WILLIAM A. SKORNIK (617) 732-1178

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - PLETHYSMOGRAPH WITH ESOPHAGEAL CATHETERIZATION PLUS ON-LINE COMPUTER
FUNCTIONAL RESIDUAL CAPACITY - BOYLE'S LAW WITH PLETHYSMOGRAPH
LUNG VOLUMES
MAXIMUM FLOW VOLUME CURVES
PERCENT VIABILITY OF ALVEOLAR MACROPHAGES - ALVEOLAR MACROPHAGES EXPOSED IN VITRO
ALVEOLAR MACROPHAGE FUNCTION (PHAGOCYTOSIS OF PLASTIC MICROSPHERES) - ALVEOLAR MACROPHAGES EXPOSED IN VITRO
ALVEOLAR MACROPHAGE FUNCTION (PHAGOCYTOSIS OF RADIOLABELLED GOLD) - INTRATRACHEAL INSTILLATION OF LABELLED GOLD, COUNTING OF LABELLED MACROPHAGES IN VITRO
GENERAL MORPHOLOGY, HISTOPATHOLOGY
MORPHOMETRY
BIOCHEMISTRY

TEST SYSTEMS UTILIZED:

MICE, RATS, HAMSTERS, GUINEA PIGS, DOGS

COMPOUNDS TESTED:

VARIOUS AIR POLLUTANTS INCLUDING COMBUSTION PRODUCTS OF POLY-VINYL CHLORIDE AND POLYSTYRENE AND VARIOUS SULFUR COMPOUNDS

ANESTHESIA:

TESTS PERFORMED ON RODENTS ARE GENERALLY PERFORMED WITHOUT THE USE OF ANESTHESIA; TESTS PERFORMED ON DOGS ARE PERFORMED DURING SUSTAINED ANESTHESIA.

TERMINAL:

THE RESPIRATORY MECHANICS TESTS ARE NOT OF A TERMINAL NATURE; HOWEVER, DEFENSE MECHANISM TESTS, HISTOLOGY AND BIOCHEMICAL RESEARCH ARE PERFORMED ON SACRIFICED ANIMALS

HARVARD SCHOOL OF PUBLIC HEALTH (CONCLUDED)

REMARKS:

THIS ORGANIZATION IS ACTIVELY INVOLVED IN RESEARCH AND TESTING OF VARIOUS ASPECTS OF THE PULMONARY SYSTEM; CHANGING RESEARCH PROJECTS VARY THE TYPE OF TESTS PERFORMED; IN ADDITION TO WILLIAM A. SKORNIK AND DR. JEFFREY DRAZEN, DR. PHILIP C. KOSCH, DAVID E. LEITH, JOSEPH D. BRAIN AND DR. EVERETT SINNETT ARE ACTIVELY INVOLVED IN PULMONARY TESTING.

ORGANIZATION:

HAZLETON LABORATORIES AMERICA, INC.
INHALATION TOXICOLOGY DEPARTMENT
RESTON, VIRGINIA 22090

DR. WILLIAM B. COATE (703) 893-5400 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - PNEUMOTACHOGRAPH WITH ESOPHAGEAL CATHETERIZATION
LUNG VOLUMES, RESPIRATORY RATE, TIDAL VOLUME - SPIROMETRY
RESIDUAL VOLUME - GAS DILUTION (HELIUM)
DISTRIBUTION OF VENTILATION BY NITROGEN-WASHOUT - SINGLE AND MULTIPLE BREATH
CARBON MONOXIDE DIFFUSING CAPACITY - SINGLE BREATH
MAXIMUM FLOW VOLUME CURVES

TEST SYSTEMS UTILIZED:

DOGS, MONKEYS

COMPOUNDS TESTED:

VARIOUS AIR POLLUTANTS, DRUGS, CIGARETTE SMOKE

ANESTHESIA:

TESTS PERFORMED ON ANESTHETIZED AND UNANESTHETIZED ANIMALS

TERMINAL:

TESTS ARE OF A SERIAL NATURE

REMARKS:

THE EXTENT OF PULMONARY TESTING AT THIS ORGANIZATION HAS DECLINED DURING THE PAST FEW YEARS.

ORGANIZATION:

IIT RESEARCH INSTITUTE
LIFE SCIENCES DIVISION
CHICAGO, ILLINOIS 60616

CATHERINE ARANYI (312) 567-4864 (CONTACT)

TESTS PERFORMED:

RESISTANCE TO INDUCED RESPIRATORY INFECTION - PERCENT MORTALITY
CILIA BEATING FREQUENCY (IN VITRO) - ISOLATED TRACHEAL RINGS; WHOLE TRACHEAL ORGAN SYSTEM
PULMONARY CLEARANCE OF BACTERIA - INHALED RADIOLABELLED OR VIABLE BACTERIA COUNTED IN LUNG HOMOGENATE
PERCENT VIABILITY OF ALVEOLAR MACROPHAGES - ALVEOLAR MACROPHAGES EXPOSED IN VITRO OR IN VIVO
ALVEOLAR MACROPHAGE FUNCTION (PHAGOCYTOSIS OF PLASTIC MICROSPHERES) - ALVEOLAR MACROPHAGE EXPOSED IN VITRO OR IN VIVO
ACTIVITY OF ALVEOLAR MACROPHAGE ATP - ALVEOLAR MACROPHAGE EXPOSED IN VITRO OR IN VIVO

TEST SYSTEMS UTILIZED:

RABBITS (IN VITRO TESTS ONLY), MICE, HAMSTERS

COMPOUNDS TESTED:

INDUSTRIAL AND ENERGY RELATED PARTICULATES, POLLUTANTS TYPICALLY ENCOUNTERED IN VARIOUS ENVIRONMENTAL OR OCCUPATIONAL SITUATIONS

ANESTHESIA:

NA

TERMINAL:

TESTS ARE TERMINAL

REMARKS:

RICHARD EHRLICH, LEONARD J. SCHIFF AND JOHN G. DRUMMOND ARE ALSO ACTIVE IN PULMONARY TESTING AT THIS ORGANIZATION.

ORGANIZATION:

INTERNATIONAL RESEARCH AND DEVELOPMENT CORPORATION
MATTAWAN, MICHIGAN 49071

CHARLES E. ULRICH (616) 668-3336 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - AMDUR AND MEAD TECHNIQUE WITH ON-LINE COMPUTER
DISTRIBUTION OF VENTILATION BY NITROGEN-WASHOUT - MULTIPLE BREATH
GENERAL MORPHOLOGY, HISTOPATHOLOGY

TEST SYSTEMS UTILIZED:

MICE, RATS, GUINEA PIGS, DOGS, MONKEYS

COMPOUNDS TESTED:

INDUSTRIAL CHEMICALS, DRUGS, AIR POLLUTANTS

ANESTHESIA:

INITIAL ANESTHESIA ONLY

TERMINAL:

TESTS ARE TERMINAL

ORGANIZATION:

JOHNS HOPKINS UNIVERSITY
ENVIRONMENTAL HEALTH SCIENCES
BALTIMORE, MARYLAND 21205

DR. GLENN A. WARR (301) 955-3622 (CONTACT)

TESTS PERFORMED:

PULMONARY CLEARANCE OF BACTERIA - RADIOLABELLED BACTERIA COUNTED IN LUNG HOMOGENATE
PERCENT VIABILITY OF ALVEOLAR MACROPHAGES - ALVEOLAR MACROPHAGES EXPOSED IN VITO
ALVEOLAR MACROPHAGE FUNCTION (PHAGOCYTOSIS) - ALVEOLAR MACROPHAGES EXPOSED IN VITRO
BIOCHEMISTRY

TEST SYSTEMS UTILIZED:

MICE, RATS

COMPOUNDS AND CONDITIONS TESTED:

VARIOUS DRUGS, STRESS

ANESTHESIA:

ANESTHESIA IS NOT UTILIZED

TERMINAL:

TESTS ARE TERMINAL

ORGANIZATION:

LOVELACE BIOMEDICAL AND ENVIRONMENTAL RESEARCH INSTITUTE
INHALATION TOXICOLOGY RESEARCH INSTITUTE
ALBEQUERQUE, NEW MEXICO 87115

DR. JOE L. MAUDERLY (505) 264-1169 (CONTACT)

TESTS PERFORMED:

RESPIRATORY RATE, TIDAL VOLUME - NONREBREATHING VALVE; PLETHYSMOGRAPH
LUNG VOLUMES - GAS DILUTION
FUNCTIONAL RESIDUAL CAPACITY - BOYLE'S LAW WITH PLETHYSMOGRAPH; NITROGEN DILUTION
COMPLIANCE, RESISTANCE - WITH AND WITHOUT PLETHYSMOGRAPH, ESOPHAGEAL CATHETERIZATION
PRESSURE-VOLUME CURVES
MAXIMUM FLOW VOLUME CURVES
OXYGEN UPTAKE, CARBON DIOXIDE OUTPUT, RESPIRATORY EXCHANGE RATIO, ALVEOLAR GAS PRESSURES - FACE MASK OR NONREBREATHING VALVE PLUS COLLECTION
SPECIFIC VENTILATION - MINUTE VOLUME/OXYGEN UPTAKE
CARBON MONOXIDE DIFFUSING CAPACITY - SINGLE BREATH, POSITIVE PRESSURE INFLATION; STEADY-STATE END TIDAL
ARTERIAL BLOOD GASES - CAROTID PUNCTURE; FEMORAL PUNCTURE
ALVEOLAR-ARTERIAL PRESSURE DIFFERENCE
ALVEOLAR GAS PRESSURES
ENZYMATIC AND CELLULAR RESPONSE OF AIRWAYS SAMPLED BY BRONCHOPULMONARY LAVAGE - MEASUREMENTS OF LACTATE DEHYDROGENASE, GLUCOSE-6P-DEHYDROGENASE, ACID PHOSPHATASE, - GLUCORONIDASE, ALKALINE PHOSPHATASE, TRYPSIN INHIBITORY CAPACITY, SIALIC ACID AND NUCLEATED CELLS

TEST SYSTEMS UTILIZED:

RATS, HAMSTERS, DOGS, PONIES, RABBITS

COMPOUNDS TESTED:

ENERGY-ASSOCIATED EFFLUENT MATERIALS

ANESTHESIA:

NOT USED FOR DOGS OR PONIES; SUSTAINED ANESTHESIA FOR RATS AND HAMSTERS FOR ALL TESTS EXCEPT THOSE INVOLVING NONREBREATHING VALVE

LOVELACE BIOMEDICAL AND ENVIRONMENTAL RESEARCH INSTITUTE (CONCLUDED)

TERMINAL:

ALL TESTS WITH THE EXCEPTION OF BIOCHEMICAL ARE OF A SERIAL NATURE

REMARKS:

THIS ORGANIZATION IS ACTIVELY INVOLVED IN THE DEVELOPMENT OF SCREENING TESTS WHICH INDICATE PULMONARY TOXICITY. IN ADDITION TO THE RESPIRATORY MECHANICS AND BIOCHEMICAL SCREENING TESTS WHICH ARE BEING DEVELOPED AND REFINED, EFFORTS ARE CONSIDERABLE IN THE AREA OF IN VITRO ALVEOLAR MACROPHAGE FUNCTION TESTS. OTHER INDIVIDUALS ACTIVE IN PULMONARY TESTING AT THIS INSTITUTE INCLUDE DRS. EDWARD G. DAMON, ROGENE F. HENDERSON, THOMAS R. HENDERSON, JOSEPH D. HILL, MR. GEORGE J. NEWTON, AND DR. JOHN A. PICKRELL.

ORGANIZATION:

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
CAMBRIDGE, MASSACHUSETTS 02139

DR. MARY O. AMDUR (617) 253-3111 (CONTACT)
JOHN F. McCARTHY (617) 253-5069 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - AMDUR AND MEAD TECHNIQUE

TEST SYSTEMS UTILIZED:

GUINEA PIGS

COMPOUNDS TESTED:

VARIOUS AIR POLLUTANTS INCLUDING SULFUR COMPOUNDS AND OZONE

ANESTHESIA:

INITIAL ANESTHESIA ONLY

TERMINAL:

TESTS ARE OF A SERIAL NATURE

REMARKS:

THIS ORGANIZATION INTENDS TO EXPAND THEIR EFFORTS IN THE NEAR FUTURE IN THE AREA OF DEFENSE MECHANISM AND MORPHOLOGICAL MEASUREMENTS.

ORGANIZATION:

MEDICAL UNIVERSITY OF SOUTH CAROLINA
CHARLESTON, SOUTH CAROLINA 92403

DR. SAMUEL S. SPICER (803) 792-2712 (CONTACT)

TESTS PERFORMED:

GENERAL MORPHOLOGY, HISTOPATHOLOGY
MORPHOMETRY

TEST SYSTEMS UTILIZED:

RATS, DOGS

COMPOUNDS TESTED:

SULFUR DIOXIDE, (MODELS OF CYSTIC FIBROSIS)

ANESTHESIA:

NA

TERMINAL:

TESTS ARE TERMINAL

ORGANIZATION:

MOUNT SINAI MEDICAL CENTER
MIAMI BEACH, FLORIDA 33140

MARVIN A. SACKNER (305) 674-2385 (CONTACT)

TESTS PERFORMED:

FUNCTIONAL RESIDUAL CAPACITY - HELIUM DILUTION; BOYLE'S LAW WITH PLETHYSMOGRAPH
COMPLIANCE, RESISTANCE - PLETHYSMOGRAPH WITH ESOPHAGEAL CATHETERIZATION
DISTRIBUTION OF VENTILATION BY NITROGEN-WASHOUT - MULTIPLE BREATH
CARBON MONOXIDE DIFFUSING CAPACITY - MULTIPLE BREATH
ARTERIAL, VENOUS BLOOD GASES
BLOOD PRESSURES
MUCOCILIARY TRANSPORT OF INERT PARTICLES - DEPOSITED TEFLON DISKS FILMED THROUGH BRONCHOFIBERSCOPE

TEST SYSTEMS UTILIZED:

SHEEP, DOGS

COMPOUNDS TESTED:

SULFUR AND NITROGEN OXIDES, OZONE, VARIETY OF SULFATE SALTS

ANESTHESIA:

TESTS ARE PERFORMED IN UNANESTHETIZED ANIMALS

TERMINAL:

TESTS ARE OF A SERIAL NATURE

ORGANIZATION:

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
EXPERIMENTAL TOXICOLOGY BRANCH
CINCINNATI, OHIO 45226

DR. TRENT R. LEWIS (513) 684-8392 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - PLETHYSMOGRAPH WITH ESOPHAGEAL CATHETERIZATION PLUS ON-LINE COMPUTER
FUNCTIONAL RESIDUAL CAPACITY, RESIDUAL VOLUME, TOTAL LUNG CAPACITY - GAS DILUTION (HELIUM)
DISTRIBUTION OF VENTILATION BY NITROGEN-WASHOUT - SINGLE BREATH
CARBON MONOXIDE DIFFUSING CAPACITY - SINGLE BREATH WITH POSITIVE PRESSURE INFLATION AND FORCED INSPIRATION VIA EXTERNAL PRESSURE RESPIRATOR
MAXIMUM FLOW VOLUME CURVES - PLETHYSMOGRAPH PLUS APPLIED PRESSURE TO BODY

TEST SYSTEMS UTILIZED:

RATS, GUINEA PIGS, RABBITS, DOGS, MONKEYS

COMPOUNDS TESTED:

AIRBORNE INDUSTRIAL CONTAMINANTS

ANESTHESIA:

SUSTAINED ANESTHESIA

TERMINAL:

TESTS ARE OF A SERIAL NATURE

REMARKS:

MR. WILLIAM MOORMAN IS ALSO INVOLVED IN PULMONARY FUNCTION TESTING.

ORGANIZATION:

NEW YORK UNIVERSITY MEDICAL CENTER
INSTITUTE OF ENVIRONMENTAL MEDICINE
NEW YORK, NEW YORK 10016

DR. MORTON LIPPMANN (212) 679-3200 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - PNEUMOTACHOGRAPH WITH ESOPHAGEAL CATHETERIZATION
MUCOCILIARY TRANSPORT OF INERT PARTICLES - INHALED RADIOLABELLED FERRIC OXIDE SCANNED IN VIVO

TEST SYSTEMS UTILIZED:

DONKEYS

COMPOUNDS TESTED:

SULFURIC ACID, AMMONIUM SULFATE, SULFUR DIOXIDE, FREON®, VARIOUS DRUGS

ANESTHESIA:

ANESTHESIA IS NOT USED

TERMINAL:

NOT TERMINAL

ORGANIZATION:

NORTHWESTERN UNIVERSITY
DEPARTMENT OF MEDICINE
CHICAGO, ILLINOIS 60611

DR. PAUL A. GREENBERGER (312) 649-8205 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - PNEUMOTACHOGRAPH WITH ESOPHAGEAL CATHETERIZATION PLUS ON-LINE COMPUTER
MAXIMUM FLOW VOLUME CURVES

TEST SYSTEMS UTILIZED:

MONKEYS, DOGS

COMPOUNDS TESTED:

VARIOUS DRUGS

ANESTHESIA:

SUSTAINED ANESTHESIA

TERMINAL:

TESTS ARE OF A SERIAL NATURE

REMARKS:

OTHER RESEARCHERS AT THIS ORGANIZATION INCLUDE DR. ROY PATTERSON, DR. JACOB J. PRUZANSKY AND DR. C. RAYMOND ZEISS.

ORGANIZATION:

OAK RIDGE NATIONAL LABORATORY
BIOLOGY DIVISION
OAK RIDGE, TENNESSEE 37830

DR. WALDEN E. DALBEY (615) 574-0790 (CONTACT)

TESTS PERFORMED:

RESISTANCE - PLETHYSMOGRAPH WITH ESOPHAGEAL CATHETERIZATION
FUNCTIONAL RESIDUAL CAPACITY - NITROGEN DILUTION
DISTRIBUTION OF VENTILATION BY NITROGEN-WASHOUT - MULTIPLE BREATH
PRESSURE-VOLUME CURVES - EXCISED LUNGS
MAXIMUM FLOW VOLUME CURVES - PLETHYSMOGRAPH PLUS APPLIED PRESSURE THROUGH TRACHEA

TEST SYSTEMS UTILIZED:

RATS

COMPOUNDS TESTED:

CIGARETTE SMOKE, CADMIUM, NITROGEN DIOXIDE

ANESTHESIA:

SUSTAINED ANESTHESIA

TERMINAL:

THE PRESSURE-VOLUME CURVE DETERMINATIONS ARE TERMINAL MEASUREMENTS

ORGANIZATION:

ST. LUKE'S HOSPITAL
DEPARTMENT OF PATHOLOGY
NEW YORK, NEW YORK 10025

DR. STEPHEN F. RYAN (212) 870-6484 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - FORCED OSCILLATIONS WITH RESPIRATOR
TOTAL LUNG CAPACITY, FUNCTIONAL RESIDUAL CAPACITY - GAS DILUTION (HELIUM)
CARBON MONOXIDE DIFFUSING CAPACITY
ARTERIAL, VENOUS BLOOD GASES
PRESSURE VOLUME CURVES - EXCISED LUNGS, AIR AND SALINE INJECTED
MEAN ALVEOLAR INTERCEPT - LIGHT MICROSCOPY

TEST SYSTEMS UTILIZED:

RATS, HAMSTERS, DOGS

COMPOUNDS TESTED:

N-NITROSO-N-METHYLURETHANE (TO INDUCE ACUTE ALVEOLAR INJURY)

ANESTHESIA:

IN VIVO TESTS ARE PERFORMED UNDER SUSTAINED ANESTHESIA

TERMINAL:

TESTS ARE TERMINAL

REMARKS:

THIS ORGANIZATION IS INVOLVED IN RESEARCH DESCRIPTIVE OF ALVEOLAR INJURY.

ORGANIZATION:

ST. PAUL'S HOSPITAL
VANCOUVER, BRITISH COLUMBIA B6Z1Y6

DR. PETER D. PARE (604) 682-2344 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - PLETHYSMOGRAPH WITH ESOPHAGEAL CATHETERIZATION
LUNG VOLUMES, CAPACITIES - PLETHYSMOGRAPH
DISTRIBUTION OF VENTILATION BY NITROGEN-WASHOUT - SINGLE BREATH
PRESSURE-VOLUME CURVES
ARTERIAL, VENOUS BLOOD GASES
PULMONARY VASCULAR RESISTANCE
BLOOD PRESSURES
GENERAL MORPHOLOGY, HISTOPATHOLOGY

TEST SYSTEMS UTILIZED:

DOGS (ALL TESTS) MONKEYS (RESPIRATORY MECHANICS), GUINEA PIGS (RESISTANCE, COMPLIANCE AND LUNG VOLUMES, CAPACITIES)

COMPOUNDS TESTED:

NITROGEN DIOXIDE, (MODELS OF ASTHMA AND PULMONARY EDEMA)

ANESTHESIA:

TESTS PERFORMED ON DOGS AND MONKEYS ARE CONDUCTED UNDER SUSTAINED ANESTHESIA; TESTS PERFORMED ON GUINEA PIGS ARE CONDUCTED IN BOTH CONSCIOUS AND UNCONSCIOUS ANIMALS.

TERMINAL:

DOGS AND GUINEA PIGS ARE TERMINATED; MONKEYS ARE NOT

REMARKS:

THIS ORGANIZATION HAS CAPABILITIES FOR MORPHOMETRIC ANALYSIS; HOWEVER, THESE MEASUREMENTS ARE NOT CURRENTLY PERFORMED; DR. PETER D. PARE IS ALSO AN ASSISTANT PROFESSOR OF MEDICINE AT THE UNIVERSITY OF BRITISH COLUMBIA.

ORGANIZATION:

SRI INTERNATIONAL
MEDICAL SCIENCES DEPARTMENT
LIFE SCIENCES DIVISION
MENLO PARK, CALIFORNIA 94025

DR. MICHAEL J. EVANS (415) 326-2928 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - PLETHYSMOGRAPH WITH EITHER PLEURAL OR ESOPHAGEAL CATHETERIZATION
GENERAL MORPHOLOGY, HISTOPATHOLOGY
MORPHOMETRY
BIOCHEMISTRY

TEST SYSTEMS UTILIZED:

RATS, MONKEYS

COMPOUNDS TESTED:

OZONE, SULFUR AND NITROGEN OXIDES

ANESTHESIA:

RESPIRATORY MECHANICS MEASUREMENTS ARE PERFORMED UNDER SUSTAINED ANESTHESIA

TERMINAL:

TESTS ARE TERMINAL

ORGANIZATION:

STATE UNIVERSITY OF FLORIDA
DEPARTMENT OF METABOLISM
SCHOOL OF VETERINARY MEDICINE
GAINESVILLE, FLORIDA 32601

DR. DALLAS M. HYDE (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - BODY PLETHYSMOGRAPH WITH ESOPHAGEAL CATHETERIZATION
FUNCTIONAL RESIDUAL CAPACITY, RESIDUAL VOLUME - NITROGEN DILUTION
PRESSURE-VOLUME CURVES
CARBON MONOXIDE DIFFUSING CAPACITY - SINGLE BREATH
ARTERIAL, VENOUS BLOOD GASES
MORPHOMETRY

TEST SYSTEMS UTILIZED:

DOGS

COMPOUNDS TESTED:

AUTO EXHAUST, SULFUR AND NITROGEN OXIDES, OZONE

ANESTHESIA:

TESTS ARE PERFORMED UNDER SUSTAINED ANESTHESIA

TERMINAL:

MORPHOMETRIC MEASUREMENTS REQUIRE TERMINATION OF THE ANIMALS

ORGANIZATION.

SYNTEX RESEARCH
PRELIMINARY PHARMACOLOGY
PALO ALTO, CALIFORNIA 94304

ROBERT WEISSBERG (415) 855-5050 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - AMDUR AND MEAD TECHNIQUE PLUS ON-LINE COMPUTER; PLETHYSMOGRAPH WITH ENDOTRACHEAL CANNULATION AND RESPIRATOR PLUS ON-LINE COMPUTER

TEST SYSTEMS UTILIZED:

GUINEA PIGS, RABBITS, MONKEYS

COMPOUNDS TESTED:

VARIOUS DRUGS

ANESTHESIA:

INITIAL AND SUSTAINED ANESTHESIA IS USED

TERMINAL:

ONLY ARTIFICIALLY VENTILATED ANIMALS (GUINEA PIGS AND RABBITS) ARE TERMINATED

ORGANIZATION:

TEMPLE UNIVERSITY
MEDICAL SCHOOL
PHILADELPHIA, PENNSYLVANIA 19140

DR. THOMAS H. SHAFFER, III (215) 221-3277 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - PLETHYSMOGRAPH WITH ESOPHAGEAL CATHETERIZATION
LUNG VOLUMES, CAPACITIES - NEON AND HELIUM DILUTION
MAXIMUM FLOW VOLUME CURVES
ARTERIAL BLOOD GASES
LEFT-TO-RIGHT SHUNT
GENERAL MORPHOLOGY, HISTOPATHOLOGY

TEST SYSTEMS UTILIZED:

SHEEP, CATS, DOGS, RABBITS

COMPOUNDS TESTED:

VARIOUS DRUGS, VITAMIN DEFICIENCIES, DEVELOPMENTAL CHANGES

ANESTHESIA:

TESTS ARE PERFORMED UNDER SUSTAINED ANESTHESIA

TERMINAL:

TESTS ARE TERMINAL

ORGANIZATION:

UNIVERSITY OF ALBERTA
PULMONARY DIVISION
EDMONTON, ALBERTA

DR. THOMAS P. CONNOLLY (403) 432-6688 (CONTACT)

TESTS PERFORMED:

MUCOCILIARY TRANSPORT OF INERT PARTICLES - DEPOSITED RADIOLABELLED ION EXCHANGE PARTICLES SCANNED IN VIVO

TEST SYSTEMS UTILIZED:

DOGS

COMPOUNDS TESTED:

(TECHNIQUE DEVELOPMENT)

ANESTHESIA:

TESTS ARE PERFORMED UNDER SUSTAINED ANESTHESIA

TERMINAL:

TESTS ARE OF A SERIAL NATURE

ORGANIZATION:

UNIVERSITY OF ARIZONA
DEPARTMENT OF TOXICOLOGY
BIOLOGICAL SCIENCES
TUSCON, ARIZONA 85721

DR. JOHN W. CLAYTON (606) 626-3027 (CONTACT)

TESTS PERFORMED:

ALVEOLAR MACROPHAGE FUNCTION (PHAGOCYTOSIS OF RADIOLABELLED MICROSPHERE) - ALVEOLAR MACROPHAGES EXPOSED IN VITRO
PERCENT VIABILITY OF ALVEOLAR MACROPHAGES - ALVEOLAR MACROPHAGES EXPOSED IN VIVO

TEST SYSTEMS UTILIZED:

RABBITS

COMPOUNDS TESTED:

SULFURIC ACID, COMBUSTION PRODUCTS

ANESTHESIA:

NA

TERMINAL:

TESTS ARE TERMINAL

ORGANIZATION:

UNIVERSITY OF CALIFORNIA
DEPARTMENT OF PHYSIOLOGICAL SCIENCES
SCHOOL OF VETERINARY MEDICINE
DAVIS, CALIFORNIA 95616

DR. JERRY R. GILLESPIE (916) 752-0172 (CONTACT)

TESTS PERFORMED:

MAXIMUM FLOW VOLUME CURVES (APPLIED PRESSURE THROUGH TRACHEA)
RESISTANCE - FORCED OSCILLATION WITH PLETHYSMOGRAPH
FUNCTIONAL RESIDUAL CAPACITY - BOYLE'S LAW WITH PLETHYSMOGRAPH; NITROGEN DILUTION
CARBON MONOXIDE DIFFUSING CAPACITY - SINGLE BREATH WITH POSITIVE PRESSURE INFLATION
CAPILLARY BLOOD VOLUME (Vc) - CALCULATED FROM - θ_{CO} AND VALUES OF $D_{L_{CO}}$ AT DIFFERENT PaO_2
PULMONARY CLEARANCE - INHALED RADIOLABELLED PARTICLES COUNTED IN LUNG HOMOGENATE
RESPIRATION AND ATPASE ACTIVITY OF ALVEOLAR MACROPHAGE - ALVEOLAR MACROPHAGES EXPOSED IN VITRO
ALVEOLAR MACROPHAGE FUNCTION (PHAGOCYTOSIS OF BACTERIA) - ALVEOLAR MACROPHAGES EXPOSED IN VITRO
GENERAL MORPHOLOGY, HISTOPATHOLOGY

TEST SYSTEMS UTILIZED:

RATS, GUINEA PIGS, MONKEYS, DOGS

COMPOUNDS TESTED:

OZONE, OXIDES OF SULFUR, OXIDES OF NITROGEN, FLY ASH

ANESTHESIA:

SUSTAINED ANESTHESIA

TERMINAL:

ONLY MFVC IS TERMINAL; HISTOPATHOLOGICAL EXAMINATION REQUIRES THAT THE ANIMALS BE TERMINATED

UNIVERSITY OF CALIFORNIA (CONCLUDED)

REMARKS:

THIS ORGANIZATION IS ACTIVELY INVOLVED IN PULMONARY TESTING AND RESEARCH; IN ADDITION TO DR. JERRY R. GILLESPIE, THE FOLLOWING INDIVIDUALS ARE ALSO INVOLVED IN PULMONARY TESTING: JIM BERRY, DR. JERRY F. GREEN, MARTHA H. LYNN, CHRIS PETERS, JOHN W. WATSON AND CRAIG D. WEGNER.

ORGANIZATION:

UNIVERSITY OF CALIFORNIA, IRVINE
AIR POLLUTION HEALTH EFFECTS LABORATORY
COMMUNITY AND ENVIRONMENTAL MEDICINE
SCHOOL OF MEDICINE
IRVINE, CALIFORNIA 92717

T.T. CROCKER (714) 833-5853 (CONTACT)
R.F. PHALEN (714) 833-5860
P. REISCHL (714) 833-6371

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - FLOW METER PLUS ESOPHAGEAL CATHETERIZATION
O_2 UPTAKE, CO_2 OUTPUT
CARBON MONOXIDE DIFFUSING CAPACITY - SINGLE, MULTIPLE BREATH
DISTRIBUTION OF VENTILATION BY NITROGEN-WASHOUT-MULTIPLE BREATH
ARTERIAL BLOOD GASES
MUCOCILIARY TRANSPORT OF INERT PARTICLES - INHALED CHROMIUM LABELLED POLYSTYRENE PARTICLES COUNTED IN FECES AND IN CHEST
MORPHOLOGY, HISTOPATHOLOGY - MANUAL AND AUTOMATED MORPHOMETRIC ANALYSIS; LUNG CASTING FOR MORPHOMETRY
MACROPHAGE MOBILITY-IN VITRO

TEST SYSTEMS UTILIZED:

RATS (DEFENSE MECHANISM TESTS AND SEMI-QUANTITATIVE HISTOLOGY),
DOGS (RESPIRATORY MECHANICS, MORPHOMETRIC ANALYSIS),
MACROPHAGES (EXPOSURE IN VIVO, MEASURE MOBILITY IN VITRO)

COMPOUNDS AND CONDITIONS TESTED:

INHALATION ONLY, MASKS AND CHAMBERS:
OZONE, SULFUR DIOXIDE, NITROGEN DIOXIDE, SULFATES, NITRATES, SULFURIC ACID, RELATIVE HUMIDITY AND TEMPERATURE ARE CONTROLLED, ATMOSPHERES CAN BE AGED FOR VARIABLE PERIODS

ANESTHESIA:

ANESTHESIA IS NOT UTILIZED DURING POLLUTANT EXPOSURES
ANESTHESIA IS UTILIZED WHEN ANIMALS ARE SACRIFICED

TERMINAL:

MORPHOLOGY AND MICROCILIARY TRANSPORT TESTS ARE TERMINAL.

UNIVERSITY OF CALIFORNIA, IRVINE (CONCLUDED)

REMARKS:

STUDY COMBINATIONS OF GASES AND PARTICLES IN
SINGLE ACUTE OR REPEATED ACUTE EXPOSURES.
ANIMALS ARE EXPOSED AT REST OR WHILE EXERCISING.

ORGANIZATION:

UNIVERSITY OF CALIFORNIA
DIVISION OF ENVIRONMENTAL AND NUTRITIONAL
SCIENCES
SCHOOL OF PUBLIC HEALTH
CENTER FOR HEALTH SERVICES
LOS ANGELES, CALIFORNIA 90024

DR. MAHAMMAD G. MUSTAFA (213) 825-1153 (CONTACT)

TESTS PERFORMED:

BIOCHEMICAL BATTERY
MORPHOLOGY
ISOLATED LUNG PERFUSION

TEST SYSTEMS UTILIZED:

RATS; IN THE PAST OTHER SYSTEMS, INCLUDING MONKEYS, HAVE BEEN UTILIZED

COMPOUNDS TESTED:

AIR POLLUTANTS (e.g., OZONE, SULFUR AND NITROGEN OXIDES)

ANESTHESIA:

FOR LUNG PERFUSION STUDIES

TERMINAL:

YES

REMARKS:

IN ADDITION TO DR. MUSTAFA, DR. DONALD F. TIERNEY IS ALSO ACTIVE IN PULMONARY TESTING IN THIS ORGANIZATION. THIS LABORATORY COLLABORATES WITH DR. TIMOTHY T. CROCKER AND ASSOCIATES AT THE UNIVERSITY OF CALIFORNIA AT IRVINE. DR. MAHAMMAD G. MUSTAFA ALSO WORKS AT THE PULMONARY DIVISION, DEPARTMENT OF MEDICINE.

ORGANIZATION:

UNIVERSITY OF CALIFORNIA
CARDIOVASCULAR RESEARCH INSTITUTE
SAN FRANCISCO, CALIFORNIA 94143

DR. BRIAN DAVIS (415) 666-2282 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - PNEUMOTACHOGRAPH WITH ESOPHAGEAL CATHETERIZATION
LUNG VOLUMES AND CAPACITIES - HELIUM DILUTION
CARBON MONOXIDE DIFFUSING CAPACITY - SINGLE AND MULTIPLE BREATH TECHNIQUES
PRESSURE-VOLUME CURVES - PNEUMOTACHOGRAPH WITH RESPIRATOR
ARTERIAL BLOOD GASES
MUCOCILLIARY TRANSPORT OF INERT PARTICLES - INHALED RADIOLABELLED PARTICLES SCANNED IN VIVO AND IN EXCISED TRACHEA
MORPHOLOGICAL STUDIES; MORPHOMETRIC ANALYSES
BIOCHEMICAL STUDIES

TEST SYSTEMS UTILIZED:

DOGS, CATS, FERRETS, RATS (SMALL ANIMALS USUALLY FOR MORPHOLOGY, AND BIOCHEMISTRY STUDIES ONLY)

COMPOUNDS TESTED:

OZONE, AUTONOMIC AGENTS

ANESTHESIA:

TESTS ARE PERFORMED UNDER SUSTAINED ANESTHESIA

TERMINAL:

TESTS ARE USUALLY TERMINAL, EXCEPT SOME CHRONIC STUDIES WITH DOGS

ORGANIZATION:

UNIVERSITY OF CINCINNATI
DEPARTMENT OF ENVIRONMENTAL HEALTH
SCHOOL OF MEDICINE
CINCINNATI, OHIO 45221

DR. ALLEN VINEGAR (513) 872-5718 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - VARIOUS TECHNIQUES, WITH AND WITHOUT PLETHYSMOGRAPH
CARBON MONOXIDE DIFFUSING CAPACITY - SINGLE BREATH
PRESSURE-VOLUME CURVES
MAXIMUM FLOW VOLUME CURVES

TEST SYSTEM UTILIZED:

RATS, GUINEA PIGS

COMPOUNDS TESTED:

SULFUR DIOXIDE, SULFURIC ACID, ALUMINUM SULFATE, CADMIUM CHLORIDE (DRINKING WATER)

ANESTHESIA:

SUSTAINED ANESTHESIA IS USED FOR MOST TESTS; CERTAIN COMPLIANCE, RESISTANCE TECHNIQUES DO NOT REQUIRE ANESTHESIA

TERMINAL:

TESTS ARE TERMINAL

REMARKS:

DR. ALLEN VINEGAR IS WORKING TO REFINE TECHNIQUES AND EQUIPMENT USED FOR PULMONARY FUNCTION TESTING.

ORGANIZATION:

UNIVERSITY OF GUELPH
DEPARTMENT OF BIOMEDICAL SCIENCES
GUELPH, ONTARIO

DR. PARVATHI K. BASRUR (519) 824-4120 (CONTACT)

TESTS PERFORMED:

GENERAL MORPHOLOGY, HISTOPATHOLOGY
MORPHOMETRY - SCANNING ELECTRON MICROSCOPY, TRANSMISSION ELECTRON MICROSCOPY
SIZE AND DISTRIBUTION OF MUCUS SECRETING CELLS

TEST SYSTEMS UTILIZED:

HAMSTERS

COMPOUNDS TESTED:

COMPONENTS OF CIGARETTE SMOKE

ANESTHESIA:

ANESTHESIA IS NOT UTILIZED

TERMINAL:

TESTS ARE TERMINAL

ORGANIZATION:

UNIVERSITY OF KENTUCKY
PHARMACODYNAMICS AND TOXICOLOGY
COLLEGE OF PHARMACY
LEXINGTON, KENTUCKY 40506

DR. LOUIS DIAMOND (606) 257-2770 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - PLETHYSMOGRAPH WITH ESOPHAGEAL CATHETERIZATION; PLETHYSMOGRAPH WITH FORCED OSCILLATIONS
FUNCTIONAL RESIDUAL CAPACITY - BOYLE'S LAW WITH PLETHYSMOGRAPH
PRESSURE-VOLUME CURVES - PLETHYSMOGRAPH PLUS RESPIRATOR; EXCISED LUNGS
MAXIMUM FLOW VOLUME CURVES - PLETHYSMOGRAPH PLUS APPLIED PRESSURE THROUGH TRACHEA
CARBON MONOXIDE DIFFUSING CAPACITY - SINGLE BREATH, POSITIVE PRESSURE INFLATION

TEST SYSTEMS UTILIZED:

RATS, RABBITS, CATS

COMPOUNDS TESTED:

VARIOUS DRUGS

ANESTHESIA:

SUSTAINED ANESTHESIA

TERMINAL:

TESTS ARE OF A SERIAL NATURE EXCEPT MFVC, WHICH IS TERMINAL

ORGANIZATION:

UNIVERSITY OF MICHIGAN
PULMONARY DIVISION
MEDICAL CENTER
ANN ARBOR, MICHIGAN 48104

DR. DAVID R. DANTZKER (313) 764-2260 (CONTACT)

TESTS PERFORMED:

ARTERIAL BLOOD GASES
COMPLIANCE, RESISTANCE - PNEUMOTACHOGRAPH WITH ESOPHAGEAL CATHETERIZATION

TEST SYSTEMS UTILIZED:

DOGS, CATS

COMPOUNDS TESTED:

RESEARCH ON RESPIRATORY MUSCLE FATIGUE

ANESTHESIA:

TESTS ARE PERFORMED UNDER SUSTAINED ANESTHESIA

TERMINAL:

TESTS ARE TERMINAL

ORGANIZATION:

UNIVERSITY OF NORTH CAROLINA
DEPARTMENT OF PULMONARY MEDICINE
SCHOOL OF MEDICINE
CHAPEL HILL, NORTH CAROLINA 27514

DR. RUSSELL L. PIMMEL (919) 966-2532 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - PLETHYSMOGRAPH WITH ESOPHAGEAL CATHETERIZATION
COMPLIANCE, RESISTANCE - FORCED OSCILLATIONS WITH RESPIRATOR
LUNG VOLUMES, CAPACITIES - HELIUM DILUTION
CARBON MONOXIDE DIFFUSING CAPACITY - MULTIPLE BREATH

TEST SYSTEMS UTILIZED:

GUINEA PIGS AND HAMSTERS (PLETHYSMOGRAPH TECHNIQUES) DOGS (ALL OTHER TECHNIQUES)

COMPOUNDS TESTED:

OZONE, PHARMACOLOGICAL AGENTS, MODELS OF INFECTION

ANESTHESIA:

TESTS ARE PERFORMED UNDER SUSTAINED ANESTHESIA

TERMINAL:

TESTS ARE OF A SERIAL NATURE

REMARKS:

IN ADDITION TO DR. RUSSELL L. PIMMEL, DR. GERALD L. STROPE AND DR. MITCHELL FRIEDMAN ARE ACTIVELY INVOLVED IN PULMONARY TESTING.

ORGANIZATION:

UNIVERSITY OF NORTH DAKOTA
DEPARTMENT OF PHYSIOLOGY
SCHOOL OF MEDICINE
GRAND FORKS, NORTH DAKOTA 58202

DR. HENRY O. STINNETT (701) 777-3974 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - PLETHYSMOGRAPH WITH ESOPHAGEAL CATHETERIZATION
LUNG VOLUMES, CAPACITIES - PLETHYSMOGRAPH
BLOOD PRESSURES
OXYGEN UPTAKE

TEST SYSTEMS UTILIZED:

GUINEA PIGS, RABBITS, DOGS

COMPOUNDS TESTED:

(SEE REMARKS)

ANESTHESIA:

TESTS ARE PERFORMED UNDER SUSTAINED ANESTHESIA

TERMINAL:

TESTS ARE TERMINAL

REMARKS:

THIS ORGANIZATION HAS CAPABILITIES TO PERFORM PULMONARY TESTS IN ALL SIZE ANIMALS UP TO MONKEYS. THE TESTS CURRENTLY PERFORMED ARE DONE ROUTINELY FOR THE PURPOSE OF TEACHING PULMONARY PHYSIOLOGY.

ORGANIZATION:

UNIVERSITY OF PENNSYLVANIA
PHILADELPHIA, PENNSYLVANIA 19104

DR. MARIA DELIVORIA-PAPADOPOULOS (215) 662-3225 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - PNEUMOTACHOGRAPH WITH ESOPHAGEAL CATHETERIZATION
FUNCTIONAL RESIDUAL CAPACITY - NEON DILUTION
TOTAL LUNG CAPACITY
OXYGEN CONSUMPTION
ARTERIAL BLOOD GASES
MORPHOLOGY - GROSS MEASUREMENTS

TEST SYSTEMS UTILIZED:

LAMBS (PRETERM AND POSTNATAL), PIGLETS

COMPOUNDS AND CONDITIONS TESTED:

CARBON MONOXIDE, STRESS

ANESTHESIA:

INITIAL ANESTHESIA ONLY

TERMINAL:

TESTS ARE USUALLY TERMINAL

REMARKS:

DR. MARIA DELIVORIA-PAPADOPOULOS ALSO WORKS AT THE HOSPITAL OF THE UNIVERSITY OF PENNSYLVANIA AS THE DIRECTOR OF NEWBORN SERVICE.

ORGANIZATION:

UNIVERSITY OF PITTSBURGH
GRADUATE SCHOOL OF PUBLIC HEALTH
PITTSBURGH, PENNSYLVANIA 15261

DR. YVES ALARIE (412) 624-3047 (CONTACT)

REMARKS:

ALTHOUGH THE RESEARCHERS AT THIS ORGANIZATION HAVE BEEN INVOLVED IN THE DEVELOPMENT AND APPLICATION OF MANY RESPIRATORY MECHANICS MEASUREMENT TECHNIQUES, THESE CLASSICAL TESTS ARE NO LONGER PERFORMED. THIS ORGANIZATION IS CURRENTLY INVOLVED IN DEVELOPING MEASUREMENTS IN TWO NEW AREAS: SENSORY IRRITATING PROPERTIES AND AIRBORNE PULMONARY HYPERSENSITIVITY. SEE DR. JOSEPH A. *WATSON (SAME ORGANIZATION) FOR INFORMATION CONCERNING PULMONARY* DEFENSE SYSTEM MEASUREMENTS PERFORMED BY THIS GROUP.

ORGANIZATION:

UNIVERSITY OF PITTSBURGH
GRADUATE SCHOOL OF PUBLIC HEALTH
PITTSBURGH, PENNSYLVANIA 15261

DR. JOSEPH A. WATSON (412) 624-2732 (CONTACT)

TESTS PERFORMED:

ALVEOLAR MACROPHAGE FUNCTION (PHAGOCYTOSIS OF INHALED COMPOUNDS)-ALVEOLAR MACROPHAGE EXPOSED IN VIVO
MUCOCILIARY TRANSPORT OF INHALED COMPOUNDS

TEST SYSTEMS UTILIZED:

RATS

COMPOUNDS TESTED:

COAL DUST (INSTILLATION)

ANESTHESIA:

INITIAL ANESTHESIA ONLY

TERMINAL:

TESTS ARE TERMINAL

REMARKS:

NEW TEST METHODS DEVELOPMENT IS ALSO BEING CONDUCTED, SEE ENTRY UNDER DR. YVES ALARIE, SAME ORGANIZATION.

ORGANIZATION:

UNIVERSITY OF ROCHESTER
RADIATION BIOLOGY AND BIOPHYSICS DEPARTMENT
SCHOOL OF MEDICINE AND DENTISTRY
ROCHESTER, NEW YORK 14642

DR. JURAJ FERIN (716) 275-3726 (CONTACT)

TESTS PERFORMED:

PULMONARY CLEARANCE OF INERT PARTICLES - LUNG BURDEN OF INHALED TiO_2 DETERMINED IN LUNG HOMOGENATE
PULMONARY CLEARANCE OF BACTERIA - INHALED RADIOLABELLED BACTERIA COUNTED IN LUNG HOMOGENATE; INHALED VIABLE BACTERIA COUNTED IN LUNG HOMOGENATE
ALVEOLAR MACROPHAGE FUNCTION (PHAGOCYTOSIS OF INERT PARTICLES)

TEST SYSTEMS UTILIZED:

RATS

COMPOUNDS TESTED:

SULFUR AND NITROGEN OXIDES, OZONE, DIESEL EXHAUST

ANESTHESIA:

NA

TERMINAL:

TESTS ARE TERMINAL

REMARKS:

SEE DR. RICHARD W. HYDE (SAME ORGANIZATION) FOR INFORMATION CONCERNING RESPIRATORY MECHANICS MEASUREMENTS PERFORMED BY THIS GROUP.

ORGANIZATION:

UNIVERSITY OF ROCHESTER
SCHOOL OF MEDICINE AND DENTISTRY
ROCHESTER, NEW YORK 14642

DR. RICHARD W. HYDE (716) 275-4861 (CONTACT)

TESTS PERFORMED:

LUNG VOLUMES - GAS DILUTION (HELIUM)
COMPLIANCE, RESISTANCE - FORCED OSCILLATIONS WITHOUT PLETHYSMOGRAPH

TEST SYSTEMS UTILIZED:

DOGS

COMPOUNDS TESTED:

HISTAMINE, EPOXY

ANESTHESIA:

SUSTAINED ANESTHESIA

TERMINAL:

TESTS ARE OF A SERIAL NATURE

REMARKS:

TESTS ARE USED TO STUDY MECHANISMS OF PULMONARY EDEMA IN DOGS. SEE DR. JURAJ FERIN (SAME ORGANIZATION) FOR INFORMATION CONCERNING DEFENSE MECHANISM MEASUREMENTS PERFORMED BY THIS GROUP.

ORGANIZATION:

UNIVERSITY OF SOUTH ALABAMA
COLLEGE OF MEDICINE
MOBILE, ALABAMA 36688

DR. AUBREY E. TAYLOR (205) 460-7004 (CONTACT)

TESTS PERFORMED:

PULMONARY VASCULAR RESISTANCE
LONGITUDINAL DISTRIBUTION OF VASCULAR RESISTANCE
BLOOD PRESSURES

TEST SYSTEMS UTILIZED:

DOGS

COMPOUNDS TESTED:

(MODELS OF LUNG DAMAGE)

ANESTHESIA:

TESTS ARE PERFORMED UNDER SUSTAINED ANESTHESIA

TERMINAL:

TESTS ARE TERMINAL

ORGANIZATION:

UNIVERSITY OF TEXAS
MEDICAL BRANCH
GALVESTON, TEXAS 77550

DR. ROBERT E. BARROW (713) 765-2786 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - PNEUMOTACHOGRAPH WITH ESOPHAGEAL CATHETERIZATION
RESPIRATORY RATE, TIDAL VOLUME - CAPACITANCE RESPIROMETER

TEST SYSTEMS UTILIZED:

RABBITS, DOGS, RATS

COMPOUNDS TESTED:

CHLORINE GAS, OXYGEN TOXICITY

ANESTHESIA:

ANESTHESIA IS NOT USED

TERMINAL:

TESTS ARE TERMINAL

REMARKS:

GAS EXCHANGE AND CIRCULATORY MEASUREMENTS ARE ALSO PERFORMED, SEE ENTRY UNDER DR. ROBERT E. DRAKE, SAME ORGANIZATION.

ORGANIZATION:

UNIVERSITY OF TEXAS
DEPARTMENT OF ANESTHESIOLOGY
MEDICAL BRANCH
GALVESTON, TEXAS 77550

DR. ROBERT E. DRAKE (713) 765-1906 (CONTACT)

TESTS PERFORMED:

ARTERIAL AND VENOUS BLOOD GASES
PULMONARY VASCULAR RESISTANCE
LONGITUDINAL DISTRIBUTION OF VASCULAR RESISTANCE
BLOOD PRESSURES
LEFT-TO-RIGHT SHUNT
GENERAL MORPHOLOGY, HISTOPATHOLOGY

TESTS SYSTEMS UTILIZED:

DOGS

COMPOUNDS TESTED:

HISTAMINE, ALLOXAN, SHOCK THERAPY

ANESTHESIA:

TESTS ARE PERFORMED UNDER SUSTAINED ANESTHESIA

TERMINAL:

TESTS ARE TERMINAL

REMARKS:

RESPIRATORY MECHANICS MEASUREMENTS ARE ALSO PERFORMED, SEE ENTRY UNDER DR. ROBERT E. BARROW, SAME ORGANIZATION.

ORGANIZATION:

UNIVERSITY OF TEXAS
DIVISION OF PULMONARY DISEASES
SCHOOL OF MEDICINE
SAN ANTONIO, TEXAS 78284

DR. WALDEMAR G. JOHANSON, JR. (512) 696-9660 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - PLETHYSMOGRAPH (LARGE ANIMALS) OR PNEUMOTACHOGRAPH (SMALL ANIMALS) WITH ESOPHAGEAL CATHETERIZATION
DISTRIBUTION OF VENTILATION BY NITROGEN-WASHOUT - SINGLE AND MULTIPLE BREATH TECHNIQUES (LARGE ANIMALS)
MAXIMUM FLOW VOLUME CURVES (LARGE ANIMALS)
CARBON MONOXIDE DIFFUSING CAPACITY - MULTIPLE BREATH (LARGE ANIMALS)
PULMONARY CLEARANCE OF BACTERIA - INHALED VIABLE BACTERIA COUNTED IN LUNG HOMOGENATE (SMALL ANIMALS)
ARTERIAL BLOOD GASES
GENERAL MORPHOLOGY, HISTOPATHOLOGY (SMALL ANIMALS)
MORPHOMETRY (SMALL ANIMALS)
BIOCHEMISTRY

TEST SYSTEMS UTILIZED:

RATS, HAMSTERS, RABBITS, DOGS, BABOONS

COMPOUNDS TESTED:

CIGARETTE SMOKE, NICOTINE, OLEIC ACID, HCl, BLEOMYCIN, PARAQUAT, STRESS

ANESTHESIA:

TESTS ARE PERFORMED UNDER SUSTAINED ANESTHESIA

TERMINAL:

DOGS AND SMALL ANIMALS ARE USUALLY TERMINATED; MEASUREMENTS IN BABOONS ARE OF A SERIAL NATURE

REMARKS:

DR. HENRY C. McGILL IS ALSO ACTIVE IN PULMONARY RESEARCH AT THIS ORGANIZATION.

ORGANIZATION:

UNIVERSITY OF TEXAS SOUTHWESTERN MEDICAL SCHOOL
DALLAS, TEXAS 75235

DR. ROBERT L. JOHNSON (214) 688-3421 (CONTACT)
DR. ALAN K. PIERCE (214) 688-3429 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - PLETHYSMOGRAPH WITH ESOPHAGEAL CATHETERIZATION
LUNG VOLUMES AND CAPACITIES - HELIUM DILUTION
CARBON MONOXIDE DIFFUSING CAPACITY - MULTIPLE BREATH
PULMONARY CLEARANCE OF BACTERIA - INHALED VIABLE BACTERIA COUNTED IN LUNG HOMOGENATE
GENERAL MORPHOLOGY, HISTOPATHOLOGY
MORPHOMETRY - MEAN ALVEOLAR INTERCEPT

TEST SYSTEMS UTILIZED:

DOGS, MICE (PULMONARY CLEARANCE)

COMPOUNDS TESTED:

PHARMACOLOGICALLY ACTIVE AGENTS

ANESTHESIA:

ANESTHESIA IS NOT UTILIZED

TERMINAL:

MICE STUDIES ARE TERMINAL. DOG TESTS ARE OF A SERIAL NATURE; HOWEVER, THEY MAY BE EUTHANIZED FOR PURPOSES OF MORPHOLOGICAL EXAMINATION.

ORGANIZATION:

UNIVERSITY OF UTAH
SCHOOL OF MEDICINE
SALT LAKE CITY, UTAH 84132

DR. SUETARO WATANABE (801) 581-7806 (CONTACT)

TESTS PERFORMED:

PRESSURE-VOLUME CURVES - EXCISED LUNGS, AIR AND SALINE INJECTION

TEST SYSTEMS UTILIZED:

PIGS

COMPOUNDS TESTED:

TECHNIQUE DEVELOPMENT

ANESTHESIA:

NA

TERMINAL:

TESTS ARE TERMINAL

REMARKS:

THIS ORGANIZATION IS PREPARING FOR FURTHER INVOLVEMENT IN RESPIRATORY MECHANICS MEASUREMENTS. OTHER RESEARCHERS INCLUDE DR. LAWRENCE B. SANDBERG.

ORGANIZATION:

UNIVERSITY OF WASHINGTON
DEPARTMENT OF ENVIRONMENTAL HEALTH
SCHOOL OF PUBLIC HEALTH AND COMMUNITY MEDICINE
SEATTLE, WASHINGTON 98195

DR. ROBERT FRANK (206) 543-4383 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - AMDUR AND MEAD TECHNIQUE;
PLETHYSMOGRAPH WITH ENDOTRACHEAL CANNULATION AND RESPIRATOR
DISTRIBUTION OF VENTILATION BY NITROGEN-WASHOUT - MULTIPLE BREATH
FUNCTIONAL RESIDUAL CAPACITY - GAS DILUTION
CARBON MONOXIDE DIFFUSING CAPACITY - SINGLE BREATH
MAXIMUM FLOW VOLUME CURVES
GENERAL MORPHOLOGY, HISTOPATHOLOGY

TEST SYSTEMS UTILIZED:

RATS, GUINEA PIGS (AMDUR/MEAD TECHNIQUE ONLY), DOGS

COMPOUNDS TESTED:

OZONE, SULFUR DIOXIDE, SULFURIC ACID, SODIUM AND ALUMINUM SULFATE

ANESTHESIA:

TESTS (EXCEPT AMDUR AND MEAD TECHNIQUE) ARE PERFORMED UNDER SUSTAINED ANESTHESIA

TERMINAL:

TESTS ARE TERMINAL

REMARKS:

IN ADDITION TO DR. ROBERT FRANK, DR. THOMAS A. STANDAERT, DR. LEONARD D. HUDSON AND MARIANNE HOWARD ARE ACTIVELY INVOLVED IN DEVELOPING SYSTEMS FOR PULMONARY TESTING.

ORGANIZATION:

UNIVERSITY OF WISCONSIN
AGRICULTURAL EXPERIMENT STATION
MADISON, WISCONSIN 53705

DR. GERALD E. BISGARD (608) 262-2962 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - PNEUMOTOCHOGRAPH WITH ESOPHAGEAL CATHETERIZATION
FUNCTIONAL RESIDUAL CAPACITY - NITROGEN DILUTION
DISTRIBUTION OF VENTILATION BY NITROGEN-WASHOUT
ARTERIAL BLOOD GASES

TEST SYSTEMS UTILIZED:

DOGS, COWS, GOATS, PONIES

COMPOUNDS TESTED:

RESPIRATORY DISEASES

ANESTHESIA:

TESTS ARE PERFORMED IN CONSCIOUS ANIMALS

TERMINAL:

TESTS ARE OF A SERIAL NATURE

ORGANIZATION:

THE UPJOHN COMPANY
HYPERSENSITIVITY DEPARTMENT
KALAMAZOO, MICHIGAN 49001

FRANK B. MARSALISI (616) 323-4000 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - PNEUMOTACHOGRAPH WITH PLEURAL CATHETERIZATION

TEST SYSTEMS UTILIZED:

DOGS

COMPOUNDS TESTED:

DRUGS

ANESTHESIA:

SUSTAINED

TERMINAL:

TESTS ARE OF A SERIAL NATURE

ORGANIZATION:

U.S. ARMY MEDICAL RESEARCH INSTITUTE OF INFECTIOUS DISEASES
ANIMAL ASSESSMENT DIVISION
FORT DETRICK
FREDERICK, MARYLAND 21701

DR. CHING-TONG LIU (301) 663-2148 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - PNEUMOTACHOGRAPH WITH ESOPHAGEAL CATHETERIZATION, ENDOTRACHEAL CANNULA
TIDAL VOLUME, RESPIRATORY RATE, OXYGEN UPTAKE - HEAD COVER WITH SPIROMETER
FUNCTIONAL RESIDUAL CAPACITY - HELIUM DILUTION
CARBON DIOXIDE OUTPUT - ENDOTRACHEAL CANNULA, ONE-WAY VALVE
SPECIFIC VENTILATION

TEST SYSTEMS UTILIZED:

MONKEYS

COMPOUNDS TESTED:

DISEASE EXPOSURES

ANESTHESIA:

SUSTAINED ANESTHESIA EXCEPT FOR TIDAL VOLUME, RESPIRATORY RATE AND OXYGEN UPTAKE.

TERMINAL:

TESTS ARE OF A SERIAL NATURE

REMARKS:

THE PULMONARY TESTS PERFORMED IN MONKEYS ARE A SMALL PART OF OVERALL DISEASE TESTING. DR. MICHAEL KASTELLO (SAME ORGANIZATION, 663-7453) IS PREPARING TO PERFORM COMPLIANCE, RESISTANCE (PLETHYSMOGRAPH WITH ESOPHAGEAL CATHETERIZATION) AND LUNG VOLUMES (GAS DILUTION) ON RODENTS EXPOSED TO VARIOUS DISEASES.

ORGANIZATION:

U.S. ENVIRONMENTAL PROTECTION AGENCY
FUNCTIONAL PATHOLOGY BRANCH
LABORATORY SCIENCES DIVISION
HEALTH EFFECTS RESEARCH LABORATORY
CINCINNATI, OHIO 45268

DR. WILLIAM E. PEPELKO (513) 684-7431 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - AMDUR AND MEAD TECHNIQUE WITH ON-LINE COMPUTER
RESISTANCE TO INDUCED INFECTION - PERCENT MORTALITY

TEST SYSTEMS UTILIZED:

GUINEA PIGS, MICE

COMPOUNDS TESTED:

TRANSPORTATION- AND ENERGY-RELATED EMISSIONS, VARIOUS DRUGS

ANESTHESIA:

INITIAL ANESTHESIA IS USED FOR COMPLIANCE, RESISTANCE TESTS

TERMINAL:

COMPLIANCE, RESISTANCE TESTS ARE OF A SERIAL NATURE

ORGANIZATION:

U.S. ENVIRONMENTAL PROTECTION AGENCY
HEALTH EFFECTS RESEARCH LABORATORY
RESEARCH TRIANGLE PARK, NORTH CAROLINA 27711

JUDITH A. GRAHAM (919) 541-2531 (CONTACT)

TESTS PERFORMED:

RESISTANCE TO INDUCED RESPIRATORY INFECTION - PERCENT MORTALITY
CILIA BEATING FREQUENCY (IN VITRO) - ISOLATED TRACHEAL RINGS WITH ELECTRONIC STROBOSCOPE
PULMONARY CLEARANCE OF BACTERIA - INHALED RADIOLABELLED OR VIABLE BACTERIA COUNTED IN LUNG HOMOGENATE
PERCENT VIABILITY OF ALVEOLAR MACROPHAGE - ALVEOLAR MACROPHAGE EXPOSED IN VITRO
ALVEOLAR MACROPHAGE FUNCTION (PHAGOCYTOSIS OF PLASTIC MICROSPHERES) - ALVEOLAR MACROPHAGES EXPOSED IN VITRO
ACTIVITY OF ALVEOLAR MACROPHAGE ATP - ALVEOLAR MACROPHAGES EXPOSED IN VITRO

TEST SYSTEMS UTILIZED:

GUINEA PIGS, MICE, RABBITS

COMPOUNDS TESTED:

OZONE, NITROGEN DIOXIDE, SULFURIC ACID, HEAVY METALS, SULFATES, NITRATES, VARIOUS POLLUTANT MIXTURES

ANESTHESIA:

NA

TERMINAL:

ALL TESTS ARE TERMINAL

REMARKS:

IN ADDITION TO DEFENSE MECHANISM STUDIES, DR. JOHN J. O'NEIL AND ASSOCIATES ARE ACTIVELY INVOLVED IN RESPIRATORY MECHANICS TESTING, SEE FOLLOWING ENTRY.

ORGANIZATION:

U.S. ENVIRONMENTAL PROTECTION AGENCY
HEALTH EFFECTS RESEARCH LABORATORY
RESEARCH TRIANGLE PARK, NORTH CAROLINA 27711

DR. JOHN J. O'NEIL (919) 541-2711 (CONTACT)

TESTS PERFORMED:

LUNG VOLUMES, LUNG CAPACITIES - GAS DILUTION (NEON) AND AIR INJECTION
FUNCTIONAL RESIDUAL CAPACITY - BOYLE'S LAW WITHOUT PLETHYSMOGRAPH
DISTRIBUTION OF VENTILATION BY NITROGEN-WASHOUT - MULTIPLE BREATH
CARBON MONOXIDE DIFFUSING CAPACITY - SINGLE BREATH, POSITIVE PRESSURE INFLATION
PRESSURE-VOLUME CURVES

TEST SYSTEMS UTILIZED:

RATS, HAMSTERS, GUINEA PIGS, RABBITS

COMPOUNDS TESTED:

OZONE, SULFUR AND NITROGEN OXIDES AND TRANS-2-BUTENE MIXTURE

ANESTHESIA:

SUSTAINED ANESTHESIA

TERMINAL:

NO

REMARKS:

THIS ORGANIZATION IS INVOLVED IN STANDARDIZING PULMONARY FUNCTION PROTOCOLS TO BE USED IN TOXICITY SCREENING; IN ADDITION TO DR. JOHN J. O'NEIL, ROBERT MERCER IS ACTIVELY INVOLVED IN PULMONARY TESTING; JUDITH A. GRAHAM AND ASSOCIATES ARE INVOLVED IN DEFENSE MECHANISM TESTING, SEE PRECEEDING ENTRY.

ORGANIZATION:

VANDERBILT UNIVERSITY
SCHOOL OF MEDICINE
NASHVILLE, TENNESSEE 37232

DR. KENNETH L. BRIGHAM (615) 322-3412 (CONTACT)

TESTS PERFORMED:

ARTERIAL, VENOUS BLOOD GASES
CAPILLARY BLOOD VOLUME
PULMONARY VASCULAR RESISTANCE
BLOOD PRESSURES
LEFT-TO-RIGHT SHUNT
GENERAL MORPHOLOGY, HISTOPATHOLOGY

TEST SYSTEMS UTILIZED:

SHEEP

COMPOUNDS TESTED:

HISTAMINE, PROSTAGLANDINS, ENDOTOXIN, BACTERIA

ANESTHESIA:

ANESTHESIA IS NOT USED

TERMINAL:

TESTS ARE OF A SERIAL NATURE

REMARKS:

THIS ORGANIZATION IS PREPARING FOR FURTHER INVOLVEMENT IN RESPIRATORY MECHANICS MEASUREMENTS. OTHER RESEARCHERS INCLUDE DR. THOMAS R. HARRIS.

ORGANIZATION:

VETERANS ADMINISTRATION HOSPITAL
PULMONARY DEPARTMENT
CINCINNATI, OHIO 45220

DR. HAMID SAHEBJAMI (513) 861-3100 (CONTACT)

TESTS PERFORMED:

PRESSURE-VOLUME CURVES - EXCISED LUNGS, AIR AND SALINE INJECTION
MORPHOMETRY-CYTOPLASMIC COMPONENTS OF TYPE 2 CELLS
(ELECTRON MICROSCOPE)

TEST SYSTEMS UTILIZED:

RATS

COMPOUNDS TESTED:

CADMIUM, OXYGEN, CADMIUM OXIDE

ANESTHESIA:

NA

TERMINAL:

TESTS ARE TERMINAL

ORGANIZATION:

VIRGINIA MASON RESEARCH CENTER
RESPIRATION PHYSIOLOGY DEPARTMENT
SEATTLE, WASHINGTON 98101

DR. JACOB HILDEBRANDT (206) 624-1144 EXT. 426 (CONTACT)
DR. YIH-LOONG LAI (206) 624-1144 EXT. 716 (CONTACT)
W.J.E. LAMM (206) 624-1144 EXT. 716 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE
FUNCTIONAL RESIDUAL CAPACITY - BOYLE'S LAW WITH PLETHYSMOGRAPH; NITROGEN DILUTION
PRESSURE-VOLUME CURVES - PLETHYSMOGRAPH PLUS INFLATOR; EXCISED LUNGS, AIR AND SALINE INJECTED
ARTERIAL BLOOD GASES

TEST SYSTEMS UTILIZED:

RATS, GUINEA PIGS, RABBITS, CATS, DOGS

COMPOUNDS TESTED:

TECHNIQUE DEVELOPMENT, CARBON DIOXIDE, OVALBUMIN SENSITIZED

ANESTHESIA:

TESTS ARE PERFORMED UNDER SUSTAINED ANESTHESIA AND DURING AWAKE STATES.

TERMINAL:

SOME TESTS ARE TERMINAL AND SOME ARE CHRONIC.

REMARKS:

ROBERT K. WINN, HAROLD I. MODELL AND ALFRED J. PRATT ARE ALSO INVOLVED IN PULMONARY RESEARCH AT THIS ORGANIZATION.

ORGANIZATION:

YALE UNIVERSITY
NEW HAVEN, CONNECTICUT

DR. JAMES S. DOUGLAS (203) 436-4771 (CONTACT)

TESTS PERFORMED:

COMPLIANCE, RESISTANCE - AMDUR AND MEAD TECHNIQUE WITH ON-LINE COMPUTER

TEST SYSTEMS UTILIZED:

GUINEA PIGS

COMPOUNDS TESTED:

CARBON DIOXIDE, SULFUR OXIDES, VARIOUS DRUGS

ANESTHESIA:

INITIAL ANESTHESIA IS USED

TERMINAL:

TESTS ARE OF A SERIAL NATURE.

REMARKS:

DR. JAMES S. DOUGLAS ALSO WORKS AT THE JOHN B. PIERCE FOUNDATION LABORATORY (203) 562-9901 EXTENSION 51.

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APPENDIX A

TESTS PERFORMED BY EACH ORGANIZATION

MORPHOLOGICAL MEASUREMENTS

GENERAL MORPHOLOGY, HISTOPATHOLOGY

Allied Chemical Corporation
Battelle Memorial Institute
Boston University
Harvard School of Public Health
International Research and Development Corporation
St. Paul's Hospital
South Carolina Medical University
SRI International
Temple University
University of California, Davis
University of California, Irvine
University of California, Los Angeles
University of California, San Francisco
University of Guelph
University of Pennsylvania
University of Texas, Dallas
University of Texas, Galveston
University of Texas, San Antonio
University of Washington
Vanderbilt University

MORPHOMETRY

Boston University
Harvard School of Public Health
South Carolina Medical University
SRI International
State University of Florida
University of California, Irvine
University of California, San Francisco
University of Guelph
University of Texas, Dallas
University of Texas, San Antonio
Veterans Administration Hospital

RESPIRATORY MECHANICS MEASUREMENTS

FUNCTIONAL RESIDUAL CAPACITY

Allied Chemical Corporation
Battelle Memorial Institute
Boston University
Brookhaven National Laboratories
General Motors Research Laboratories
Harvard School of Public Health
Lovelace Biomedical and Environmental Research Institute
Mount Sinai Medical Center
National Institute of Occupational Safety and Health
Oak Ridge National Laboratory
St. Luke's Hospital
State University of Florida
University of California, Davis
University of Kentucky
University of Pennsylvania
University of Washington
University of Wisconsin
U.S. Army Medical Research Institute of Infectious Diseases
U.S. Environmental Protection Agency, Research Triangle Park
Virginia Mason Research Center

LUNG VOLUMES, LUNG CAPACITIES

Battelle Memorial Institute
Boston University
Brookhaven National Laboratory
Harvard School of Public Health
Hazelton Laboratories America, Inc.
Lovelace Biomedical and Environmental Research Institute
National Institute of Occupational Safety and Health
St. Luke's Hospital
St. Paul's Hospital
Temple University
University of California, San Francisco
University of North Carolina
University of North Dakota
University of Pennsylvania
University of Rochester
University of Texas, Dallas
U.S. Environmental Protection Agency, Research Triangle Park

RESPIRATORY MECHANICS MEASUREMENTS (Continued)

COMPLIANCE, RESISTANCE

Allied Chemical Corporation
Battelle Memorial Institute
Brookhaven National Laboratory
Eastern Tennessee State University
General Motors Research Laboratories
Harvard School of Public Health
Hazelton Laboratories America, Inc.
International Research and Development Corporation
Lovelace Biomedical and Environmental Research Institute
Massachusetts Institute of Technology
Mount Sinai Medical Center
National Institute of Occupational Safety and Health
New York University Medical Center
Northwestern University
Oak Ridge National Laboratory
St. Luke's Hospital
St. Paul's Hospital
SRI International
State University of Florida
Syntex Research
Temple University
University of California, Davis
University of California, Irvine
University of California, San Francisco
University of Cincinnati
University of Kentucky
University of Michigan
University of North Carolina
University of North Dakota
University of Pennsylvania
University of Rochester
University of Texas, Dallas
University of Texas, Galveston
University of Texas, San Antonio
University of Washington
University of Wisconsin
The Upjohn Company
U.S. Army Medical Research Institute of Infectious Diseases
U.S. Environmental Protection Agency, Cincinnati
Virginia Mason Research Center
Yale University

RESPIRATORY MECHANICS MEASUREMENTS (Continued)

DISTRIBUTION OF VENTILATION BY NITROGEN-WASHOUT

Battelle Memorial Institute
Brookhaven National Laboratory
Eastern Tennessee State University
Hazelton Laboratories America, Inc.
International Research and Development Corporation
Mount Sinai Medical Center
National Institute of Occupational Safety and Health
Oak Ridge National Laboratory
St. Paul's Hospital
University of California, Irvine
University of Texas, San Antonio
University of Washington
University of Wisconsin
U.S. Environmental Protection Agency, Research Triangle Park

PRESSURE-VOLUME CURVES

Battelle Memorial Institute
Boston University
Brookhaven National Laboratory
Lovelace Biomedical and Environmental Research Institute
Oak Ridge National Laboratory
St. Luke's Hospital
St. Paul's Hospital
State University of Florida
University of California, San Francisco
University of Cincinnati
University of Kentucky
University of Utah
U.S. Environmental Protection Agency, Research Triangle Park
Veterans Administration Hospital
Virginia Mason Research Center

MAXIMUM FLOW VOLUME CURVES

Boston University
General Motors Research Laboratories
Harvard School of Public Health
Hazelton Laboratories America, Inc.
Lovelace Biomedical and Environmental Research Institute
National Institute of Occupational Safety and Health

RESPIRATORY MECHANICS MEASUREMENTS (Concluded)

MAXIMUM FLOW VOLUME CURVES (Concluded)

Northwestern University
Oak Ridge National Laboratory
Temple University
University of California, Davis
University of Cincinnati
University of Kentucky
University of Texas, San Antonio
University of Washington

RESIDUAL VOLUME

Hazelton Laboratories America, Inc.

RESPIRATORY RATE, TIDAL VOLUME

Lovelace Biomedical and Environmental Research Institute
University of Texas, Galveston
U.S. Army Medical Research Institute of Infectious Diseases

GAS EXCHANGE MEASUREMENTS

ARTERIAL, VENOUS BLOOD GASES

Battelle Memorial Institute
Boston University
Lovelace Biomedical and Environmental Research Institute
Mount Sinai Medical Center
St. Luke's Hospital
St. Paul's Hospital
State University of Florida
Temple University
University of California, Irvine
University of California, San Francisco
University of Michigan
University of Pennsylvania
University of Texas, Galveston
University of Texas, San Antonio
University of Wisconsin
Vanderbilt University
Virginia Mason Research Center

O_2 UPTAKE, CO_2 OUTPUT; RESPIRATORY EXCHANGE RATIO

Lovelace Biomedical and Environmental Research Institute
University of California, Irvine
University of North Dakota
University of Pennsylvania
U.S. Army Medical Research Institute of Infectious Diseases

SPECIFIC VENTILATION

Lovelace Biomedical and Environmental Research Institute
U.S. Army Medical Research Institute of Infectious Diseases

ALVEOLAR-ARTERIAL DIFFERENCE

Lovelace Foundation

CARBON MONOXIDE DIFFUSING CAPACITY

Battelle Memorial Institute
Boston University
Brookhaven National Laboratory

GAS EXCHANGE MEASUREMENTS (Concluded)

CARBON MONOXIDE DIFFUSING CAPACITY (Concluded)

Hazelton Laboratories America, Inc.
Lovelace Biomedical and Environmental Research Institute
Mount Sinai Medical Center
National Institute of Occupational Safety and Health
St. Luke's Hospital
State University of Florida
University of California, Davis
University of California, Irvine
University of California, San Francisco
University of Cincinnati
University of Kentucky
University of North Carolina
University of Texas, Dallas
University of Texas, San Antonio
University of Washington
U.S. Environmental Protection Agency, Research Triangle Park

ALVEOLAR GAS PRESSURES

Lovelace Biomedical and Environmental Research Institute

MEAN ALVEOLAR INTERCEPT

Boston University
St. Luke's Hospital

CIRCULATORY MEASUREMENTS

CAPILLARY BLOOD VOLUME

University of California, Davis
Vanderbilt University

PULMONARY VASCULAR RESISTANCE

St. Paul's Hospital
University of South Alabama
University of Texas, Galveston
Vanderbilt University

LONGITUDINAL DISTRIBUTION OF VASCULAR RESISTANCE

University of South Alabama
University of Texas, Galveston

BLOOD PRESSURES

Mt. Sinai Medical Center
St. Paul's Hospital
University of North Dakota
University of South Alabama
University of Texas, Galveston
Vanderbilt University

LEFT-TO-RIGHT SHUNT

Temple University
University of Texas, Galveston
Vanderbilt University

DEFENSE MECHANISM MEASUREMENTS

MUCOCILIARY TRANSPORT OF INERT PARTICLES

Mount Sinai Medical Center
New York University Medical Center
University of Alberta
University of California, Irvine
University of California, San Francisco
University of Pittsburgh

CILIA BEATING FREQUENCY (IN VITRO)

IIT Research Institute
U.S. Environmental Protection Agency, Research Triangle Park

SIZE AND DISTRIBUTION OF MUCUS SECRETING CELLS

University of Guelph

PERCENT VIABILITY OF ALVEOLAR MACROPHAGES

Harvard School of Public Health
IIT Research Institute
Johns Hopkins University
University of Arizona
U.S. Environmental Protection Agency, Research Triangle Park

ALVEOLAR MACROPHAGE FUNCTION

Case Western Reserve University
Harvard School of Public Health
IIT Research Institute
Johns Hopkins University
University of Airzona
University of California, Davis
University of Pittsburgh
University of Rochester
U.S. Environmental Protection Agency, Research Triangle Park

RESPIRATION AND ATPASE ACTIVITY OF ALVEOLAR MACROPHAGE

IIT Research Institute
University of California, Davis
U.S. Environmental Protection Agency, Research Triangle Park

DEFENSE MECHANISM MEASUREMENTS (Concluded)

PULMONARY CLEARANCE OF INERT PARTICLES

University of California, Davis
University of Rochester

PULMONARY CLEARANCE OF BACTERIA

IIT Research Institute
Johns Hopkins University
University of Rochester
University of Texas, San Antonio
University of Texas, Dallas
U.S. Environmental Protection Agency, Research Triangle Park

RESISTANCE TO INDUCED RESPIRATORY INFECTION

IIT Research Institute
U.S. Environmental Protection Agency, Cincinnati
U.S. Environmental Protection Agency, Research Triangle Park

BIOCHEMICAL MEASUREMENTS

Eastern Tennessee State University
Harvard School of Public Health
Johns Hopkins University
Lovelace Biomedical and Environmental Research Institute
SRI International
University of California, Los Angeles
University of California, San Francisco
University of Texas, San Antonio

APPENDIX B

TEST SYSTEMS UTILIZED BY EACH ORGANIZATION

CATS

Temple University
University of California, San Francisco
University of Kentucky
University of Michigan
Virginia Mason Research Center

Arterial Blood Gases
Temple University
University of California, San Francisco
University of Michigan
Virginia Mason Research Center

Biochemistry
University of California, San Francisco

Carbon Monoxide Diffusing Capacity
University of Kentucky
University of California, San Francisco

Compliance, Resistance
Temple University
University of California, San Francisco
University of Kentucky
University of Michigan
Virginia Mason Research Center

Functional Residual Capacity
University of Kentucky
Virginia Mason Research Center

Left-to-Right Shunt
Temple University

Lung Volumes and Capacities
Temple University
University of California, San Francisco

Maximum Flow Volume Curves
Temple University
University of Kentucky

Morphology
Temple University
University of California, San Francisco

Mucociliary Transport of Inert Particles
University of California, San Francisco

Pressure-Volume Curves
University of California, San Francisco
University of Kentucky
Virginia Mason Research Center

COWS

University of Wisconsin

Arterial Blood Gases
University of Wisconsin

Compliance, Resistance
University of Wisconsin

Distribution of Ventilation
University of Wisconsin

Functional Residual Capacity
University of Wisconsin

DOGS

Battelle Memorial Institute
Eastern Tennessee State University
Harvard School of Public Health
Hazelton Laboratories America, Inc.
International Research and Development Corporation
Lovelace Biomedical and Environmental Research Institute
Medical University of South Carolina
Mount Sinai Medical Center
National Institute for Occupational Safety and Health
Northwestern University
St. Luke's Hospital
St. Paul's Hospital
State University of Florida
Temple University
University of Alberta
University of California, Davis
University of California, Irvine
University of California, San Francisco
University of Michigan
University of North Carolina
University of North Dakota
University of Rochester
University of South Alabama
University of Texas, Galveston
University of Texas, San Antonio
University of Texas Southwestern Medical School
University of Washington
University of Wisconsin
The Upjohn Company
Virginia Mason Research Center

DOGS (Continued)

Alveolar Gas Pressures
Lovelace Biomedical and Environmental Research Institute

Alveolar Macrophage Function
Harvard School of Public Health
University of California, Davis

Arterial Blood Gases
Battelle Memorial Institute
Lovelace Biomedical and Environmental Research Institute
Mount Sinai Medical Center
St. Luke's Hospital
St. Paul's Hospital
State University of Florida
Temple University
University of California, Irvine
University of California, San Francisco
University of Michigan
University of Texas, Galveston
University of Texas, San Antonio
University of Wisconsin
Virginia Mason Research Center

Biochemistry
Harvard School of Public Health
Eastern Tennessee State University
Lovelace Biomedical and Environmental Research Institute
University of California, San Francisco
University of Texas, San Antonio

Blood Pressures
Mount Sinai Medical Center
St. Luke's Hospital
University of North Dakota
University of South Alabama
University of Texas, Galveston

Capillary Blood Volume
University of California, Davis

Carbon Monoxide Diffusing Capacity
Battelle Memorial Institute
Hazelton Laboratories America, Inc.
Lovelace Biomedical and Environmental Research Institute
Mount Sinai Medical Center
National Institute for Occupational Safety and Health
St. Luke's Hospital
State University of Florida

DOGS (Continued)

Carbon Monoxide Diffusing Capacity (Concluded)
University of California, Davis
University of California, Irvine
University of California, San Francisco
University of North Carolina
University of Texas, San Antonio
University of Texas Southwestern Medical School
University of Washington

Compliance, Resistance
Battelle Memorial Institute
Eastern Tennessee State University
Harvard School of Public Health
Hazleton Laboratories America, Inc.
International Research and Development Corporation
Lovelace Biomedical and Environmental Research Institute
Mount Sinai Medical Center
National Institute for Occupational Safety and Health
Northwestern University
St. Luke's Hospital
St. Paul's Hospital
State University of Florida
Temple University
University of California, Davis
University of California, Irvine
University of California, San Francisco
University of Michigan
University of North Carolina
University of North Dakota
University of Rochester
University of Texas, Galveston
University of Texas, San Antonio
University of Texas Southwestern Medical School
University of Washington
University of Wisconsin
The Upjohn Company
Virginia Mason Research Center

Distribution of Ventilation
Battelle Memorial Institute
Eastern Tennessee State University
Hazleton Laboratories America, Inc.
International Research and Development Corporation
Mount Sinai Medical Center
National Institute for Occupational Safety and Health
St. Paul's Hospital
University of California, Irvine
University of Texas, San Antonio
University of Washington
University of Wisconsin

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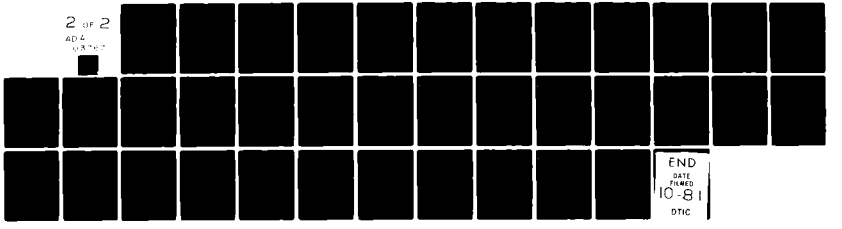
EVALUATION OF SHORT-TERM BIOASSAYS TO PREDICT FUNCTIONAL IMPAIR--ETC(U)
OCT 80 S DRILL, R THOMAS, T ZIMMERMAN DAMD17-78-C-8068
UNCLASSIFIED WP-79W00222 NL



DOGS (Continued)

Functional Residual Capacity
Battelle Memorial Institute
Harvard School of Public Health
Lovelace Biomedical and Environmental Research Institute
Mount Sinai Medical Center
National Institute for Occupational Safety and Health
State University of Florida
University of California, Davis
University of Washington
University of Wisconsin
Virginia Mason Research Center

Left-to-Right Shunt
Harvard School of Public Health
University of Texas, Galveston

Longitudinal Distribution of Vascular Resistance
University of South Alabama
University of Texas, Galveston

Lung Volumes
Harvard Laboratories America, Inc.
Lovelace Biomedical and Environmental Research Institute
St. Paul's Hospital
Temple University
University of California, San Francisco
University of North Caroline
University of North Dakota
Universtiy of Rochester
University of Texas Southwestern Medical School

Maximum Flow Volume Curves
Harvard School of Public Health
Hazelton Laboratories America, Inc.
Lovelace Biomedical and Environmental Research Institute
National Institute for Occupational Safety and Health
Northwestern University
Temple University
University of California, Davis
University of Texas, San Antonio
University of Washington

Mean Alveolar Intercept
St. Luke's Hospital

DOGS (Concluded)

Morphology/Morphometry
Battelle Memorial Institute
Harvard School of Public Health
International Research and Development Corporation
Medical University of South Carolina
St. Paul's Hospital
State University of Florida
Temple University
University of California, Davis
University of California, Irvine
University of California, San Francisco
University of Texas, Galveston
University of Texas, San Antonio
University of Texas Southwestern Medical School
University of Washington

Mucociliary Transport of Inert Particles
Mount Sinai Medical Center
University of Alberta
University of California, Irvine
University of California, San Francisco

O_2 Uptake, Co_2 Output
Lovelace Biomedical and Environmental Research Institute
University of California, Irvine
University of North Dakota

Percent Viability of Alveolar Macrophages
Harvard School of Public Health

Pressure-Volume Curves
Battelle Memorial Institute
Lovelace Biomedical and Environmental Research Institute
St. Luke's Hospital
St. Paul's Hospital
State University of Florida
University of California, San Francisco
Virginia Mason Research Center

Pulmonary Clearance
University of California, Davis
University of Texas, San Antonio
University of Texas Southwestern Medical School

DOGS (Concluded)

Pulmonary Vascular Resistance
St. Paul's Hospital
University of South Alabama
University of Texas, Galveston

Residual Volume
Hazelton Laboratories America, Inc.

Respiratory Rate, Tidal Volume
Lovelace Biomedical and Environmental Research Institute
University of Texas, Galveston

Specific Ventilation
Lovelace Biomedical and Environmental Research Institute

Total Lung Capacity
St. Luke's Hospital
St. Paul's Hospital
Temple University
University of California, San Francisco
University of North Carolina
University of North Dakota
University of Texas Southwestern Medical School

Venous Blood Gases
Mount Sinai Medical Center
St. Luke's Hospital
St. Paul's Hospital
State University of Florida
University of Texas, Galveston

Vital Capacity
Battelle Memorial Institute
St. Paul's Hospital
Temple University
University of California, San Francisco
University of North Carolina
University of North Dakota
University of Texas Southwestern Medical School

DONKEYS

New York University Medical Center

Compliance, Resistance
New York University Medical Center

DONKEYS (Concluded)

Mucociliary Transport of Inert Particles
New York University Medical Center

FERRETS

University of California, San Francisco

Arterial Blood Gases
University of California, San Francisco

Biochemistry
University of California, San Francisco

Carbon Monoxide Diffusing Capacity
University of California, San Francisco

Compliance, Resistance
University of California, San Francisco

Lung Volumes
University of California, San Francisco

Morphology/Morphometry
University of California, San Francisco

Mucociliary Transport of Inert Particles
University of California, San Francisco

Pressure Volume Curves
University of California, San Francisco

Vital Capacity
University of California, San Francisco

GOATS

University of Wisconsin

Arterial Blood Gases
University of Wisconsin

Compliance, Resistance
University of Wisconsin

Distribution of Ventilation
University of Wisconsin

Functional Residual Capacity
University of Wisconsin

GUINEA PIGS

Battelle Memorial Institute
Brookhaven National Laboratory
Case Western Reserve University
Harvard School of Public Health
International Research and Development Corporation
Massachusetts Institute of Technology
National Institute for Occupational Safety and Health
St. Paul's Hospital
Syntex Research
University of California, Davis
University of Cincinnati
University of North Carolina
University of North Dakota
University of Washington
U.S. Environmental Protection Agency, Cincinnati
U.S. Environmental Protection Agency, Research Triangle Park
Virginia Mason Research Center
Yale University

Alveolar Macrophage Function
Case Western Reserve University
Harvard School of Public Health
University of California, Davis

Arterial Blood Gases
Battelle Memorial Institute
Virginia Mason Research Center

Biochemistry
Harvard School of Public Health

Blood Pressures
University of North Dakota

Capillary Blood Volume
University of California, Davis

Carbon Monoxide Diffusing Capacity
Battelle Memorial Institute
Brookhaven National Laboratory
National Institute for Occupational Safety and Health
University of California, Davis
University of Cincinnati
University of North Carolina
University of Washington
U.S. Environmental Protection Agency, Research Triangle Park

GUINEA PIGS (Continued)

Cilia Beating Frequency
U.S. Environmental Protection Agency, Research Triangle Park

Compliance, Resistance
Battelle Memorial Institute
Brookhaven National Laboratory
Harvard School of Public Health
International Research and Development Corporation
Massachusetts Institute of Technology
National Institute for Occupational Safety and Health
St. Paul's Hospital
Syntex Research
University of California, Davis
University of Cincinnati
University of North Carolina
University of North Dakota
University of Washington
U.S. Environmental Protection Agency, Cincinnati
U.S. Environmental Protection Agency, Research Triangle Park
Virginia Mason Research Center
Yale University

Distribution of Ventilation
Battelle Memorial Institute
Brookhaven National Laboratory
International Research and Development Corporation
National Institute for Occupational Safety and Health
University of Washington
U.S. Environmental Protection Agency, Research Triangle Park

Functional Residual Capacity
Battelle Memorial Institute
Brookhaven National Laboratory
Harvard School of Public Health
National Institute for Occupational Safety and Health
University of California, Davis
University of Washington
U.S. Environmental Protection Agency, Research Triangle Park
Virginia Mason Research Center

Lung Capacities
St. Paul's Hospital
University of North Carolina
University of North Dakota
U.S. Environmental Protection Agency, Research Triangle Park

GUINEA PIGS (Concluded)

Lung Volumes
Brookhaven National Laboratory
Harvard School of Public Health
St. Paul's Hospital
University of North Carolina
University of North Dakota
U.S. Environmental Protection Agency, Research Triangle Park

Maximum Flow Volume Curves
Harvard School of Public Health
National Institute for Occupational Safety and Health
University of California, Davis
University of Cincinnati
University of Washington

Morphology/Morphometry
Battelle Memorial Institute
Harvard School of Public Health
International Research and Development Corporation
University of California, Davis
University of Washington

Oxygen Uptake
University of North Dakota

Pressure-Volume Curves
Battelle Memorial Institute
Brookhaven National Laboratory
University of Cincinnati
U.S. Environmental Protection Agency, Research Triangle Park
Virginia Mason Research Center

Pulmonary Clearance
University of California, Davis
U.S. Environmental Protection Agency, Research Triangle Park

Pulmonary Vascular Resistance
St. Paul's Hopsital

Resistance to Induced Infection
U.S. Environmental Protection Agency, Cincinnati
U.S. Environmental Protection Agency, Research Triangle Park

Vital Capacity
Battelle Memorial Institute

HAMSTERS

Boston University
Harvard School of Public Health
IIT Research Institute
Lovelace Biomedical and Environmental Research Institute
St. Luke's Hospital
University of Guelph
University of North Carolina
University of Texas, San Antonio
U.S. Environmental Protection Agency, Research Triangle Park

Alveolar Gas Pressures
Lovelace Biomedical and Environmental Research Institute

Alveolar Macrophage Function
Harvard School of Public Health
IIT Research Institute

Arterial Blood Gases
Boston University
Lovelace Biomedical and Environmental Research Institute
St. Luke's Hospital
University of Texas, San Antonio

Biochemistry
Harvard School of Public Health
Lovelace Biomedical and Environmental Research Institute
University of Texas, San Antonio

Carbon Monoxide Diffusing Capacity
Boston University
Lovelace Biomedical and Environmental Research Institute
St. Luke's Hospital
University of North Carolina
U.S. Environmental Protection Agency, Research Triangle Park

Cilia Beating Frequency
IIT Research Institute

Compliance, Resistance
Harvard School of Public Health
Lovelace Biomedical and Environmental Research Institute
St. Luke's Hospital
University of North Carolina
University of Texas, San Antonio

Distribution of Ventilation
U.S. Environmental Protection Agency, Research Triangle Park

HAMSTERS (Concluded)

Functional Residual Capacity
Boston University
Harvard School of Public Health
Lovelace Biomedical and Environmental Research Institute
St. Luke's Hospital
U.S. Environmental Protection Agency, Research Triangle Park

Lung Volumes/Capacities
Boston University
Harvard School of Public Health
Lovelace Biomedical and Environmental Research Institute
St. Luke's Hospital
University of North Carolina
U.S. Environmental Protection Agency, Research Triangle Park

Maximum Flow Volume Curves
Boston University
Harvard School of Public Health
Lovelace Biomedical and Environmental Research Institute

Mean Alveolar Intercept
Boston University
St. Luke's Hospital

Morphology/Morphometry
Harvard School of Public Health
University of Guelph
University of Texas, San Antonio

Oxygen Uptake, Carbon Dioxide Output
Lovelace Biomedical and Environmental Research Institute

Pressure-Volume Curves
Boston University
Lovelace Biomedical and Environmental Research Institute
U.S. Environmental Protection Agency, Research Triangle Park
St. Luke's Hospital

Pulmonary Clearance
IIT Research Institute
University of Texas, San Antonio

Resistance to Induced Infection
IIT Research Institute

Size and Distribution of Mucus Secreting Cells
University of Guelph

Specific Ventilation
Lovelace Biomedical and Environmental Research Institute

Venous Blood Gases
St. Luke's Hospital

LAMBS

University of Pennsylvania

Arterial Blood Gases
University of Pennsylvania

Compliance, Resistance
University of Pennsylvania

Functional Residual Capacity
University of Pennsylvania

Morphology
University of Pennsylvania

Oxygen Consumption
University of Pennsylvania

Total Lung Capacity
University of Pennsylvania

MICE

Allied Chemical Corporation
Harvard School of Public Health
IIT Research Institute
International Research and Development Corporation
Johns Hopkins University
University of Texas Southwestern Medical School
U.S. Environmental Protection Agency, Cincinnati
U.S. Environmental Protection Agency, Research Triangle Park

Alveolar Macrophage Function
Harvard School of Public Health
IIT Research Institute
Johns Hopkins University
U.S. Environmental Protection Agency, Research Triangle Park

Biochemistry
Harvard School of Public Health
Johns Hopkins University

Cilia Beating Frequency
IIT Research Institute
U.S. Environmental Protection Agency, Research Triangle Park

Compliance, Resistance
Allied Chemical Corporation
Harvard School of Public Health
International Research and Development Corporation
U.S. Environmental Protection Agency, Cincinnati

MICE (Concluded)

Distribution of Ventilation
International Research and Development Corporation

Functional Residual Capacity
Allied Chemical Corporation
Harvard School of Public Health

Lung Volumes
Harvard School of Public Health

Maximum Flow Volume Curves
Harvard School of Public Health

Morphology
Allied Chemical Corporation
Harvard School of Public Health
International Research and Developmental Corporation

Pulmonary Clearance
IIT Research Institute
Johns Hopkins University
University of Texas Southwestern Medical School
U.S. Environmental Protection Agency, Research Triangle Park

Resistance to Induced Infection
IIT Research Institute
U.S. Environmental Protection Agency, Cincinnati
U.S. Environmental Protection Agency, Research Triangle Park

PIGS

University of Pennsylvania
University of Utah

Arterial Blood Gases
University of Pennsylvania

Compliance, Resistance
University of Pennsylvania

Functional Residual Capacity
University of Pennsylvania

Morphology
University of Pennsylvania

Oxygen Consumption
University of Pennsylvania

PIGS (Concluded)

Pressure-Volume Curves
University of Utah

Total Lung Capacity
University of Pennsylvania

PONIES

Lovelace Biomedical and Environmental Research Institute
University of Wisconsin

Alveolar Gas Pressures
Lovelace Biomedical and Environmental Research Institute

Arterial Blood Gases
Lovelace Biomedical and Environmental Research Institute
University of Wisconsin

Biochemistry
Lovelace Biomedical and Environmental Research Institute

Carbon Monoxide Diffusing Capacity
Lovelace Biomedical and Environmental Research Institute

Compliance, Resistance
Lovelace Biomedical and Environmental Research Institute
University of Wisconsin

Distribution of Ventilation
University of Wisconsin

Functional Residual Capacity
Lovelace Biomedical and Environmental Research Institute
University of Wisconsin

Lung Volumes
Lovelace Biomedical and Environmental Research Institute

Maximum Flow Volumes
Lovelace Biomedical and Environmental Research Institute

Oxygen Uptake, Carbon Dioxide Output
Lovelace Biomedical and Environmental Research Institute

Pressure Volume Curves
Lovelace Biomedical and Environmental Research Institute

Respiratory Rate, Tidal Volume
Lovelace Biomedical and Environmental Research Institute

Specific Ventilation
Lovelace Biomedical and Environmental Research Institute

PRIMATES

Eastern Tennessee State University
Hazelton Laboratories America, Inc.
International Research and Development Corporation
National Institute for Occupational Safety and Health
Northwestern University
St. Paul's Hospital
SRI International
Syntex Research
University of California, Davis
University of Texas, San Antonio
U.S. Army Medical Research Institute of Infectious Diseases

Alveolar Macrophage Function
University of California, Davis

Arterial Blood Gases
University of Texas, San Antonio

Biochemistry
Eastern Tennessee State University
SRI International
University of Texas, San Antonio

Carbon Monoxide Diffusing Capacity
Hazelton Laboratories America, Inc.
National Institute for Occupational Safety and Health
University of California, Davis
University of Texas, San Antonio

Capillary Blood Volume
University of California, Davis

Compliance, Resistance
Eastern Tennessee State University
Hazelton Laboratories America, Inc.
International Research and Development Corporation
National Institute for Occupational Safety and Health
Northwestern University
St. Paul's Hospital
SRI International
Syntex Research
University of California, Davis
University of Texas, San Antonio
U.S. Army Medical Research Institute of Infectious Diseases

PRIMATES (Concluded)

Distribution of Ventilation
Eastern Tennessee State University
Hazelton Laboratories America, Inc.
International Research and Development Corporation
National Institute for Occupational Safety and Health
St. Paul's Hospital
University of Texas, San Antonio

Functional Residual Capacity
National Institute for Occupational Safety and Health
University of California, Davis
U.S. Army Medical Research Institute of Infectious Diseases

Lung Volumes
Hazelton Laboratories America, Inc.
St. Paul's Hospital
U.S. Amry Medical Research Institute of Infectious Diseases

Maximum Flow Volume Curves
Hazelton Laboratories America, Inc.
National Institute for Occupational Safety and Health
Northwestern University
University of California, Davis
University of Texas, San Antonio

Morphology/Morphometry
International Research and Development Corporation
SRI International
University of California, Davis

Oxygen Uptake, Carbon Dioxide Output
U.S. Amry Medical Research Institute

Pressure Volume Curves
St. Paul's Hospital

Pulmonary Clearance
University of California, Davis

Residual Volume
Hazelton Laboratories America, Inc.

Specific Ventilation
U.S. Army Medical Research Institute of Infectious Diseases

RABBITS

Case Western Reserve University
IIT Research Institute
Lovelace Biomedical and Environmental Research Institute
National Institute for Occupational Safety and Health
Syntex Research
Temple University
University of Arizona
University of Kentucky
University of North Dakota
University of Texas, Galveston
University of Texas, San Antonio
U.S. Environmental Protection Agency, Research Triangle Park
Virginia Mason Research Institute

Alveolar-Arterial Pressure Difference
Lovelace Biomedical and Environmental Research Institute

Alveolar Gas Pressures
Lovelace Biomedical and Environmental Research Institute

Alveolar Macrophage Function
Case Western Reserve University
IIT Research Institute
University of Arizona
U.S. Environmental Protection Agency, Research Triangle Park

Arterial Blood Gases
Lovelace Biomedical and Environmental Research Institute
Temple University
University of Texas, San Antonio
Virginia Mason Research Center

Blood Pressures
University of North Dakota

Biochemistry
Lovelace Biomedical and Environmental Research Institute
University of Texas, San Antonio

Carbon Monoxide Diffusing Capacity
Lovelace Biomedical and Environmental Research Institute
National Institute for Occupational Safety and Health
University of Kentucky
U.S. Environmental Protection Agency, Research Triangle Park

Cilia Beating Frequency
IIT Research Institute
U.S. Environmental Protection Agency, Research Triangle Park

RABBITS (Continued)

Compliance, Resistance
Lovelace Biomedical and Environmental Research Institute
National Institute for Occupational Safety and Health
Syntex Research
Temple University
University of Kentucky
University of North Dakota
University of Texas, Galveston
University of Texas, San Antonio
Virginia Mason Research Center

Distribution of Ventilation
National Institute for Occupational Safety and Health
U.S. Environmental Protection Agency, Research Triangle Park
University of Texas, San Antonio

Functional Residual Capacity
Lovelace Biomedical and Environmental Research Institute
National Institute for Occupational Safety and Health
University of Kentucky
U.S. Environmental Protection Agency, Research Triangle Park
Virginia Mason Research Center

Left-to-Right Shunt
Temple University

Lung Volumes
Lovelace Biomedical and Environmental Research Institute
Temple University
University of North Dakota
University of Texas, Galveston
U.S Environmental Protection Agency, Research Triangle Park

Maximum Flow Volume Curves
Lovelace Biomedical and Environmental Research Institute
National Institute for Occupational Safety and Health
Temple University
University of Kentucky

Morphology
Temple University
University of Texas, San Antonio

Oxygen Uptake, Carbon Dioxide Output
Lovelace Biomedical and Environmental Research Institute
University of North Dakota

RABBITS (Concluded)

Pressure Volume Curves
Lovelace Biomedical and Environmental Research Institute
University of Kentucky
U.S. Environmental Protection Agency, Research Triangle Park
Virginia Mason Research Center

Pulmonary Clearance
University of Texas, San Antonio
U.S. Environmental Protection Agency, Research Triangle Park

Resistance to Induced Infection
U.S. Environmental Protection Agnecy, Research Triangle Park

Specific Ventilation
Lovelace Biomedical and Environmental Research Institute

RATS

Allied Chemical Corporation
Battelle Memorial Institute
Boston University
Brookhaven National Laboratory
General Motors Research Laboratories
Harvard School of Public Health
International Research and Development Corporation
Johns Hopkins University
Lovelace Biomedical and Environmental Research Institute
Medical University of South Carolina
National Institute for Occupational Safety and Health
Oak Ridge National Laboratory
St. Luke's Hospital
SRI International
University of California, Davis
University of California, Irvine
University of California, Los Angeles
University of California, San Francisco
University of Cincinnati
University of Kentucky
University of Pittsburgh
University of Rochester
University of Texas, Galveston
University of Texas, San Antonio
University of Washington
U.S. Environmental Protection Agency, Research Triangle Park
Veterans Administration Hospital
Virginia Mason Research Center

RATS (Continued)

Alveolar Gas Pressures
Lovelace Biomedical and Environmental Research Institute

Alveolar Macrophage Function
Harvard School of Public Health
Johns Hopkins University
University of California, Davis
University of Pittsburgh
University of Rochester

Arterial Blood Gases
Battelle Memorial Institute
Boston University
Lovelace Biomedical and Environmental Research Institute
St. Luke's Hospital
University of Texas, San Antonio
Virginia Mason Research Center

Biochemistry
Harvard School of Public Health
Johns Hopkins University
Lovelace Biomedical and Environmental Research Institute
SRI International
University of California, Los Angeles
University of California, San Francisco
University of Texas, San Antonio

Capillary Blood Volume
University of California, Davis

Carbon Monoxide Diffusing Capacity
Battelle Memorial Institute
Boston University
Brookhaven National Laboratory
Lovelace Biomedical and Environmental Research Institute
National Institute for Occupational Safety and Health
St. Luke's Hospital
University of California, Davis
University of Cincinnati
University of Kentucky
University of Washington
U.S. Environmental Protection Agency, Research Triangle Park

Compliance and Resistance
Allied Chemical Corporation
Battelle Memorial Institute
Brookhaven National Laboratory
General Motors Research Labroatories

RATS (Continued)

Compliance and Resistance (Concluded)
Harvard School of Public Health
International Research and Development Corporation
Lovelace Biomedical and Environmental Research Institute
National Institute for Occupational Safety and Health
Oak Ridge National Laboratory
St. Luke's Hospital
SRI International
University of California, Davis
University of Cincinnati
University of Kentucky
University of Texas, Galveston
University of Texas, San Antonio
University of Washington
Virginia Mason Research Center

Distribution of Ventilation
Battelle Memorial Institute
Brookhaven National Laboratory
International Research and Development Corporation
National Institute for Occupational Safety and Health
Oak Ridge National Laboratory
University of Washington
U.S. Environmental Protection Agency, Research Triangle Park

Functional Residual Capacity
Allied Chemical Corporation
Battelle Memorial Institute
Boston University
Brookhaven National Laboratory
General Motors Research Laboratory
Harvard School of Public Health
Lovelace Biomedical and Environmental Research Institute
National Institute for Occupational Safety and Health
Oak Ridge National Laboratory
University of California, Davis
University of Kentucky
University of Washington
U.S. Environmental Protection Agency, Research Triangle Park
Virginia Mason Research Center

Lung Perfusion
University of California, Los Ageles

RATS (Continued)

Lung Volumes, Capacities
Boston University
Brookhaven National Laboratory
Harvard School of Public Health
Lovelace Biomedical and Environmental Research Institute
St. Luke's Hospital
University of Texas, Galveston
U.S. Environmental Protection Agency, Research Triangle Park

Maximum Flow Volume Curves
Boston University
General Motors Research Laboratories
Harvard School of Public Health
Lovelace Biomedical and Environmental Research Institute
National Institute for Occupational Safety and Health
Oak Ridge National Laboratory
University of California, Davis
University of Cincinnati
University of Kentucky
University of Washington

Mean Alveolar Intercept
Boston University
St. Luke's Hospital

Morphology/Morphometry
Allied Chemical Corporation
Battelle Memorial Institute
Boston University
Harvard School of Public Health
International Research and Development Corporation
Medical University of South Carolina
SRI International
University of California, Davis
University of California, Irvine
University of California, Los Angeles
University of California, San Francisco
University of Texas, San Antonio
University of Washington
Veterans Administration Hospital

Mucociliary Transport
University of California, Irvine
University of Pittsburgh

Oxygen Uptake, Carbon Dioxide Output
Lovelace Biomedical and Environmental Research Institute

RATS (Concluded)

Pressure-Volume Curves
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Boston University
Brookhaven National Laboratory
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Oak Ridge National Laboratory
St. Luke's Hospital
University of California, San Francisco
University of Cincinnati
University of Kentucky
U.S. Environmental Protection Agency, Research Triangle Park
Veterans Administration Hospital
Virginia Mason Research Center

Pulmonary Clearance
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University of California, Davis
University of Rochester
University of Texas, San Antonio

Specific Ventilation
Lovelace Biomedical and Environmental Research Institute

Venous Blood Gases
St. Luke's Hospital

Vital Capacity
Battelle Memorial Institute

SHEEP

Mount Sinai Medical Center
Temple University
Vanderbilt University

Arterial/Venous Blood Gases
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Temple University
Vanderbilt University

Blood Pressure
Vanderbilt University

Capillary Blood Volume
Vanderbilt University

SHEEP (Concluded)

Carbon Monoxide Diffusing Capacity
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Compliance, Resistance
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Temple University

Distribution of Ventilation
Mount Sinai Medical Center

Functional Residual Capacity
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Left-to-Right Shunt
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Vanderbilt University

Lung Volumes/Capacities
Temple University

Maximum Flow Volume Curves
Temple University

Morphology
Temple University
Vanderbilt University

Mucociliary Transport
Mount Sinai Medical Center

Pulmonary Vascular Resistance
Vanderbilt University

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APPENDIX C

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Zeiss, Dr. C. Raymond	Northwestern University

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APPENDIX D

INDIVIDUALS UNAVAILABLE FOR COMMENT BUT LIKELY TO BE ACTIVE IN PULMONARY TESTING IN SMALL ANIMALS

RESEARCHER/ORGANIZATION	PROBABLE AREA OF INTEREST
H. Boushey University of California San Francisco, California	Respiratory mechanics
L. Cobb Huntington Research Center Cambridge, England	Respiratory mechanics
J. Crapo Duke University Durham, North Carolina	Morphology, morphometry
F. Duchosal Battelle Research Center 7 Route de Drize 1227 Carouge Geneva, Switzerland	Respiratory mechanics
D.M. Hiett University of Manchester Manchester, England	Respiratory mechanics, general morphology, morphometry
M. King McGill University Montreal, Quebec	Respiratory mechanics
F.J. Miller U.S. Environmental Protection Agency Research Triangle Park, North Carolina	Respiratory mechanics
W. Mitzner John Hopkins University Baltimore, Maryland	Morphology, respiratory mechanics
R. Nadeau University of Montreal Montreal, Quebec	Respiratory mechanics
J.A. Nadel University of California San Francisco, California	Respiratory mechanics
C.G. Plopper University of California Davis, California	Respiratory mechanics

RESEARCHER/ORGANIZATION	PROBABLE AREA OF INTEREST
R. Rylander University of Gothenburg Gothenburg, Sweden	Defense mechanisms
E. Sinnett National Institute of Health Bethesda, Maryland	Morphology
E.R. Weibel University of Bern Bern, Switzerland	Morphometry
M.J. Weister U.S. Environmental Protection Agency Research Triangle Park, North Carolina	Respiratory mechanics

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